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An Address

ON

THE VALUE OF

PATHOLOGICAL AND X RAY EXAMINATIONS IN ABDOMINAL SURGERY.

Delivered at the Dorset County Hospital, Dorchester, at the Opening of the new Pathological Department and X Ray and Electrical Rooms on Sept. 21st, 1921,

BY JAMES SHERREN, C.B.E., F.R.C.S. ENG.,
SURGEON TO THE LONDON HOSPITAL, ETC.

SURGERY has a fascination possessed by few occupations. By its aid diseases and injury, incurable by nature alone or aided by altering the constitution of the body fluids, can be eradicated or assisted in such a way that natural processes are enabled to bring about a cure. This work can be carried out so that its benefits are obvious to the naked eye; it is the one direct method we have to-day of combating disease which is already established in the body. Enthusiastic as we may be about operative methods of treatment, we all look forward to the day when the causes of surgical diseases are known with certainty and measures can be taken to prevent their development. It is, however, only with the help of departments such as it has been my privilege to open to-day that this can be brought about. The establishment of these in hospitals and the recognition of the invaluable aid they can give is one of the greatest advances in modern surgery.

Surgery has many branches; that dealing with the abdomen is the one in which I take the greatest interest and led to the title of this address. It would, perhaps, be an exaggeration to say that there is no such thing as abdominal medicine, but the abdomen is a region of the body that should be approached with a surgical mind. Many lives would be saved and much suffering avoided if this were done. How many cases of carcinoma of the stomach, to take a common example, have been told that there was nothing seriously wrong, finally to seek surgical aid when the condition was too far advanced to be benefited. How many tragedies does this not call to mind! I recently saw a gentleman with an enormous inoperable mass in the abdomen who, on retiring from business nine months previously, developed suspicious gastric symptoms. His medical attendant wished him to see a surgeon; the patient's friends said "No—he will surely be operated on." He was diagnosed flatulent dyspepsia—allowed to go for a trip round the world and returned inoperable. Never a month passes but I see cases of this nature.

The surgeon is the only individual who has the correlated knowledge of symptoms, signs, and the actual condition of parts as seen during life. This clinical knowledge cannot be possessed by the physician. We have too often heard it said of patients —"he was afraid to go to a surgeon as he would be certain to operate." The public seem to think that surgery is synonymous with operating; this fallacy ought to be seriously combated. The modern surgeon is not an operating machine, although if he has to bring this art into play he should have a rapid and sure technique with the power of quick decision when faced with the unexpected.

THE STATUS OF A HOSPITAL DEPENDENT ON ITS SPECIAL DEPARTMENTS.

One judges of the value of the work done by a hospital, not by the beauty of its wards or the up-to-date nature of its operating theatres, valuable as these are in treatment, but by the special departments, particularly those for pathological and X ray investigation, and the use that is made of them. Without the facilities given by these, not only can there be no life in our work but no progress: the dry bones of surgery can only live when breathed upon by knowledge gained from such investigations.

Surgery is now so wide that no one individual can thoroughly master the whole of it and be equally at home in the cavity of the skull and in the abdomen; of those special branches of medicine dealing with the departments of which I have been speaking still less are we able to do the work ourselves even had we the necessary training. Team work is inevitable. It is, of course, impossible to have a team without a head; a cricket team without a captain stands as little chance of winning matches as a ship in which all men are equal has of ever reaching its destination. The only individual who possesses the necessary knowledge is the clinician; he alone knows the nature of the symptoms and realises, perhaps dimly, their meaning, and as a result of that valuable asset, clinical experience, he can determine the nature of the investigations required for diagnosis and of the special forms of treatment that may be requisite. His must be the guiding hand.

Before discussing the great value of these methods I should like to emphasise that, in the abdomen, the history as given by the patient must ever be the most important factor in diagnosis, which would, in most cases, be impossible on pathological and X ray investigation alone. In some branches of surgery the history may not be so important to diagnosis. X ray examination reveals the fracture and its nature; microscopic examination of a portion of an ulcer of the tongue tells us that we are dealing with malignant disease. But in investigating abdominal disease we cannot obtain such direct evidence, and these methods have to be fitted in with the history which is usually the last court of appeal. The functions of a pathological laboratory are manifold; not only have histological investigations to be carried out, often at short notice, but bacteriological and chemical. The clinical pathologist needs to be familiar with every method of investigation.

SPECIAL INVESTIGATIONS IN ACUTE CASES.

In acute abdominal emergencies no time should ever be wasted. A careful history must always be taken; this, with the symptoms and physical signs and examination of the urine, which ought never to be neglected, must be our guide. After all our reliance must be on ourselves. To await some special form of investigation while peritoneal infection or damage to intestine is possibly increasing is quite unjustifiable. In the less acute cases we may obtain much help; where no great danger is anticipated by delay every endeavour should be made to come to an accurate diagnosis before the abdomen is opened. For example, acute tuberculous peritonitis may sometimes lead to the suspicion of typhoid, a disease of protean types. Our laboratory colleague at once is able to tell us the blood reaction and its degree.

In the diagnosis of complications arising during recovery after operation we may get much help. To take, as an example, the disease of which there can be no doubt that surgery in the first few hours is the only justifiable treatment—appendicitis. Unfortunately we do not get all as early as this, and it is these late cases that often tax our skill to the utmost if we are to bring them to a successful termination. All may not be going well, there is a rise of temperature perhaps to 100° each night, and rectal examination and examination of the chest does not reveal the cause; a blood count will give us the warning of the formation of a residual abscess. Again, when there is suspicious dullness at the right base without displacement of the heart, X ray examination of the chest may show us the situation of the fluid—above or below the diaphragm. If below, we know from experience that it is certainly pus and also the great danger of delay—in these cases following appendicitis. I am a wholehearted sceptic as to the value of vaccine treatment, in acute abdominal conditions at any rate. I have never known it do good so shall not discuss it.

X ray examination is invaluable in cases of acute right-sided pain, so often diagnosed incorrectly as appendicitis. At every period of duty at hospital when the house surgeon is new I am asked to see these cases of acute pain in the right iliac fossa as appendicitis, which they certainly are not; of the nature of some of them I am still uncertain. All with any surgical experience of the abdomen will recall cases in which the appendix was removed and a stone was later found in the ureter and had to be treated by operation or passed naturally, and many more in which the appendix was removed without relief for pain confined to the right iliac fossa. X ray investigation and careful examination of the urine will prevent the former mistake being made.

We must always be on the alert for tubal pregnancy and disease in women; these are frequent causes of unilateral pain, but tubal disease does not usually require immediate operation. One serious condition requiring immediate interference which may give rise to right-sided pain is perforation of a duodenal ulcer. In cases in which this is subacute and the fluid escapes slowly it may trickle down on the outer side of the ascending colon and give rise to right-sided symptoms; knowledge of this fact will prevent these cases from being overlooked.

SPECIAL INVESTIGATIONS IN CHRONIC CASES.

I will now pass to the type of case in which special investigations are so often necessary; in at least 90 per cent. of chronic cases we should have recourse to the pathological or X ray department at some time during the illness, either for diagnosis, prognosis, or both. Chronic abdominal diseases fall into two groups, those in which the diagnosis can be made by clinical methods—particularly careful history-taking—and those in which the symptoms are not clear and do not conform to those of any named disease. It is in the latter group that special methods of investigation are so helpful, although they should never be neglected as confirmatory evidence in the former.

I should like to give two examples from the latter group to illustrate my meaning. Both were women with left-sided pain, and in both the pain was diagnosed as renal in origin. The history in neither was typical; the pain—in its site and spread—did not have all the characteristics of renal pain; neither did it have the characteristics of pain due to the disease from which the patients were found eventually to be suffering—in one, an hour-glass stomach with a posterior ulcer eroding the pancreas, in the other malignant disease of the splenic flexure of the colon. By X ray investigation the correct diagnosis was made, which enabled me to carry out operative treatment successfully knowing beforehand the condition with which I had to deal.

VALUE OF X RAYS IN ABDOMINAL DIAGNOSIS.

In speaking of the value of X ray work in abdominal diagnosis one naturally starts with its earliest victory—that of revealing calculi in the urinary passages; this of itself is of the greatest value, not only in those elusive cases of right-sided pain, but also in many left-sided. Disease of the stomach, gall-bladder, and the appendix may all give rise to pain in the left iliac fossa and a suspicion of ureteric calculus raised, to be settled by this method of examination. This left-sided pain in chronic posterior gastric ulcer and in diseases of the gall-bladder is more common than is generally realised. It is unfortunate that so far X rays cannot reveal gall-stones for us with the same accuracy as they do stones in the urinary tract. The frequency, however, with which they are demonstrated is yearly increasing with greater knowledge and improved technique. While from time to time we are able to get positive results, the constitution and size of gall-stones differ so much that no reliance should be placed on negative reports; and we must always bear in mind that the causes of biliary colic are numerous and that a typical attack is not necessarily diagnostic of gall-stones. We have, therefore, to rely on our history, symptoms, and physical signs; we must make our diagnosis of biliary colic from history and symptoms, and occasionally are able, from symptoms and signs, to determine, definitely, its cause. If the diagnosis of biliary colic is to be correct, we must realise that the pain never starts in the gall-bladder region, but is epigastric or right round the waist as a band, in the back, and occasionally the left side.

The introduction of X ray investigation of the alimentary tract after an opaque meal has advanced our knowledge of abdominal anatomy and physiology, and, in certain cases, is a great aid in diagnosis. It has also the somewhat doubtful advantage that a shadow of the viscera can be depicted in a photograph that may be presented to the patient showing the dropped stomach or the dropped colon, whichever it happens to be the fashion to treat. The whole subject of visceroptosis is so complex and bound up with the well-being of the abdominal autonomic nervous system that it is very difficult to believe that any form of operation fixing ptoses of this description is likely to be of permanent good; in fact, more harm than good has been done in many of these cases. It is a treatment that should only be carried out as a last resort. I am not yet convinced that the mere fact that the stomach or cæcum is lower than is considered normal is any sign of disease.

X ray examination after an opaque meal may confirm the opinion formed that the case is one of visceroptosis, and, thus, if other disease can be excluded, in my opinion unlikely to be helped by operative treatment. We must guard against a too ready acceptance of this diagnosis. The symptoms of the condition are so various that it is difficult to be certain, and I always remind myself that the fact that a patient has visceroptosis does not shelter him from other more serious abdominal disease. Gall-stones, which it frequently mimics, are not infrequently found, and I have known carcinoma of the stomach overlooked in these patients, as it probably would not have been had an opaque meal been given.

ROUTINE X RAY EXAMINATION IN A GASTRIC CASE.

The opaque meal should be given six hours before the patient is to be examined. The first point to note is the rate of passage of the meal through the intestinal canal, much more important above than below; normally the whole of it should have left the stomach in five hours and the head of the meal should be half-way across the transverse colon. Any residue in the stomach is evidence of gastric stasis and denotes some organic lesion, the nature of which may be at once apparent by definite signs indicating the presence of carcinoma or ulcer. But these may exist without stasis; in this case a residue may sometimes be seen in the crater of an ulcer. The actual time taken for the material to leave the body is not important; there are such wide variations in individuals of normal health. It is important, however, that there should be no undue delay in the small intestine; such delay is, however, rare. The question of intestinal stasis and its treatment is so involved and of so controversial a character that I could not profitably discuss it briefly. I would, however, remark that I believe it is rarely necessary to operate, and that the failures of operative treatment far exceed the successes.

After these points have been noted, if the diagnosis is not clear the patient is again given a meal, and the tone, peristalsis, and position of the stomach first investigated. Filling defects indicative of growth, niches or accessory pockets, direct evidence of ulceration, may be noted, or the presence of a bilocular or hour-glass stomach. In the organic type the two pouches are rarely seen filled simultaneously, the fluid not infrequently being held in the upper for a considerable time before passing into the lower. The spasmodic type in which the stomach is ⧜-shaped does not necessarily or usually denote an ulcer.

I have very briefly sketched out what should be looked for in the routine X ray examination of a gastric case. Before dealing with its value in diagnosis in the various gastric lesions I must speak shortly of its utility in diseases of the colon.

VALUE OF X RAY INVESTIGATION IN DISEASES OF THE COLON.

Except in the unusual cases in which we wish to estimate the stay of intestinal contents in this part of the alimentary canal, the opaque material is usually and, in my opinion, better administered by enema. We are able to demonstrate angulations, enlargements, and the changes caused by diverticulitis, all of the utmost importance. In the diagnosis of carcinoma it may be of the greatest help. Every suspicious case should be so investigated by X rays as a routine. Here, again, I would warn against accepting a negative finding if it does not agree with the clinical diagnosis. The possibility of carcinoma of the lower bowel should never be dismissed until examination with the sigmoidoscope has been carried out.

Malignant disease of the colon is very amenable to surgical treatment and the prognosis is good; yet how seldom do we see cases of this disease when they are really operable, not because the condition does not produce symptoms, either pain or diarrhœa, but because so little attention was paid to them. Every complaint of abdominal pain or discomfort or of anything abnormal should call for investigation by all the means at our disposal. This is one of the reasons for the statement at the beginning of my address—all abdominal cases should be considered surgically.

The early symptoms of carcinoma of the colon are usually irregularity of the bowels or painless diarrhœa. Sometimes there is colicky pain—general, or it may be in the right iliac fossa. This site for the pain has caused many errors in diagnosis; for example, I was asked to operate on a patient for intestinal obstruction on his landing from New York, after a recent operation in Canada, for "appendicitis." On seeing the patient I found that the appendix had been removed for pain confined to the right iliac fossa, due to carcinoma of the pelvic colon. This is by no means an uncommon error. Much more generally recognised is the difficulty in diagnosis between certain cases of carcinoma of the cæcum and a mass due to disease of the appendix. In both there may have been attacks of colicky pain in the mid-line. I have known mistakes made in both directions. Usually the history and physical examination is sufficient to enable the diagnosis to be made; X ray examination after an opaque enema usually clinches it at once, revealing in the one the irregular filling defect, in the other the narrowing of the cæcum from external pressure.

Left-sided pain is rarely a symptom of carcinoma of the pelvic colon; it is much more common in disease of the gall-bladder and stomach. I have had several patients with gall-stones sent to me as carcinoma of sigmoid. Adult patients with looseness of the bowels must be seriously investigated, and X ray examination is one of the most valuable methods and should never be neglected.

The help given by the investigation of the stools, not only in inflammatory disease of the colon but in pancreatic and obstructive jaundice, is often of the greatest use in diagnosis and treatment.

PATHOLOGICAL CHEMISTRY OF THE STOMACH.

It is no exaggeration to say that without access to a pathological laboratory efficient abdominal surgery is impossible. In dealing with diseases of the stomach chemical pathology is of great assistance. I attach importance to the examination of the gastric contents after a test-meal, both in diagnosis and prognosis. I have been in the habit of employing the Ewald test breakfast. With regard to the fractional test-meal much work is still being done and valuable physiological information obtained, but for surgical work it has, at present, no advantage over the simpler method of examining the gastric contents one hour after the meal. Some years must elapse before sufficient observations, checked by operative investigation, have given data to render it so satisfactory a guide.

Certain precautions are necessary; the meal must be examined in the same laboratory under the same staff. All mine have been done by Dr. P. N. Panton in the manner which he described with Dr. H. L. Tidy. It has its greatest use in diagnosis, in chronic duodenal ulcer, and certain cases of carcinoma, in prognosis, after gastric operations.

Considerable discussion has taken place with regard to the action of gastro-jejunostomy in bringing about the healing of an ulcer and in preventing the formation of other chronic ulcers elsewhere. I have shown by numerous specimens, obtained post-mortem, and by examination at operations performed for other conditions up to 11 years after, that chronic ulcers of the stomach and duodenum if they are "free" will heal and remain healed after a gastro-jejunostomy correctly performed. Also that the formation of ulcers in the region of the anastomosis is dependent upon gastric acidity. The operation is not entirely, or, in my opinion, chiefly mechanical; the change it produces in the chemistry of the stomach is of great importance. By the new opening it allows rapid emptying of the stomach and counteracts pyloric spasm, but before long food leaves again by the pylorus with no ill-effect. It should immediately abolish the free HCl and diminish by from half to two-thirds the total gastric acidity. This it does in at least 90 per cent. of cases, and in these success is certain; no fresh ulceration can take place under these circumstances unless unabsorbable material has been used. This lowered acidity is permanent; at least I have known it persist for 11 years after gastro-jejunostomy.

There are many interesting details with regard to what prevents, in some few cases, lowered gastric acidity after gastro-jejunostomy. There is one very fertile cause that I must mention—pyloric exclusion. No attempt should ever be made to bring this about. If ulcers in the pyloric region have to be directly dealt with it should be in such a manner that the pylorus is enlarged and not excluded. Every patient upon whom gastro-jejunostomy has been carried out for the cure of ulcer should have a second test-meal 14 days after operation, and if gastric acidity is not lowered, although the original ulcer will heal, fresh ulceration in the region of the anastomosis may occur unless medical measures can be found which will bring about the desired change. Test-meals are, therefore, of great importance in prognosis.

BLOOD EXAMINATION.

I must deal briefly with one other side of pathological work—blood examination. The abdominal crises of tabes have led many surgeons astray, and many gastro-jejunostomies were done for this condition when the indications for its performance were less sure than now. Still, it does present puzzling features and the only rule is always to suspect. Examination of the central nervous system should be part of the routine in investigating every chronic abdominal case. A Wassermann reaction and examination of cerebro-spinal fluid may be necessary to confirm our suspicions. Again, we are sometimes puzzled, and have opened an abdomen for a mass in the gall-bladder region, with symptoms suspicious of gall-stones, which proved to be a gumma, when the diagnosis would have been clear had we been thinking of this condition and had a Wassermann done.

Syphilitic disease of the stomach should be borne in mind. Last summer a patient came to England from abroad to consult me with regard to the possibility of removal of a large tumour of the stomach, thought to be malignant. On examining there was a gastric tumour with all the characteristics of a carcinoma of that organ. I also found a swelling in

the left epididymis, associated with a large hydrocele which I considered was syphilitic. There was no history of this disease and he had a perfectly healthy family. The X ray examination seemed to confirm the suspicion of carcinoma, but there was a positive Wassermann, and on anti-syphilitic treatment the tumour had disappeared completely in three weeks.

The surgery of the spleen is now becoming one of the commonplaces of life in the work of an abdominal surgeon. Many of its diseases are curable by operative means. Without blood examination we should be helpless. In splenic anæmia, with its leucopenia with relative increase in lymphocytes, the enlarged spleen can be removed at slight risk with the prospect of cure. The patient is saved from gradually increasing ill-health and the later development of Banti's disease. The change in the blood after splenectomy is rapid and striking; within a few weeks the white cell count has returned to normal. The blood changes in splenomegalic jaundice are typical before operation, and equally striking is its post-operative recovery.

By our blood examination we are warned away from the enlarged spleen of splenomedullary leukæmia with its 100 per cent. death-rate. In the cases of latent carcinoma of the stomach with marked anæmia, blood examination at once tells us that it is not "pernicious" and hence should raise the suspicion of carcinoma.

POST-OPERATIVE INVESTIGATIONS.

I have dealt only with some of the more recent methods; of the no less important examination of fluids and solid materials removed at operation you are all as familiar as I. As reminders I might mention that the discovery of typhoid bacilli when the biliary passages are drained, or in stones removed at operation, enables us to take precautions against infection. The report on the fluid evacuated from the cyst confirms our diagnosis of its pancreatic origin, and the finding of malignant cells in a portion of tissue removed at an exploration gives us the indication for correct treatment.

SPECIAL LESIONS.

Of all simple gastric diseases amenable to surgical treatment chronic duodenal ulcer is the most common; fortunately it is also the most easily diagnosed and has the best prognosis. Ninety per cent. at least are cured by gastro-jejunostomy, and less than 2 per cent. are failures. In this disease hyperchlorhydria is the rule, except immediately after a hæmorrhage. In a fairly large experience I have only met with two cases in which gastric acidity was lower than normal, excluding those with enormously dilated stomachs due to cicatrisation of old ulcers, in whom chronic gastritis may diminish gastric acidity; even in these the acidity is usually above normal.

With the "typical" history and the hyperchlorhydria, the diagnosis is more certain than that of any other simple abdominal condition. Unfortunately, only about 75 per cent. of cases have this "typical" history; in others the symptoms may suggest gall-stones or chronic gastric ulcer. I have recently operated on two patients in one week, both of whom had normal gall-bladders drained elsewhere and the ulcer overlooked. It is, however, by no means unusual to get coexisting gall-bladder disease. Jaundice as the result of the presence of a chronic duodenal ulcer is a far from uncommon complication, but one that rapidly clears after gastro-jejunostomy.

The right-sided pain may suggest renal colic. Several patients have come under my care with this diagnosis, who proved on investigation and operation to have chronic duodenal ulcers. The test-meal here is of the greatest assistance. We must, however, bear in mind in anomalous cases that an oxalate calculus in the kidney may give rise to hyperchlorhydria and hunger pain. In doubtful cases I always have the urinary tract X rayed. X ray examination after an opaque meal adds nothing to our certainty of diagnosis in the majority of cases and is not necessary; a hypertonic stomach with rapid emptying is the rule, and it is unusual to find direct evidence of the ulcer.

Chronic Gastric Ulcer.

In chronic gastric ulcer the test-meal is unfortunately of no diagnostic value; as a rule the condition is little removed from normal. Occasionally in ulcers that are active there may be hyperchlorhydria; in others, particularly with hour-glass stomach, there may be an absence of free HCl and a low total acidity. These cases are often diagnosed as carcinoma. In chronic gastric ulcer in men, in whom it is so much more common, the history is often as diagnostic as in chronic duodenal ulcer, but in women it may present extraordinary difficulties and certainty may be impossible.

The only direct evidence is that which may be obtained by X ray examination. The large penetrating ulcer and the constricting ulcer should be well seen. The small chronic ulcer on the lesser curvature, about the size of a shilling, that has passed through all the coats of the stomach may be demonstrated but is often missed. In every anomalous upper abdominal case X ray examination should be carried out. It must not be allowed the final word, for at the present time we cannot say that if X ray fails to reveal it no ulcer is present. The evidence must be balanced with that obtained by other means, particular importance always being attached to the history. In this connexion it must be remembered that the stomach is very responsive to lesions elsewhere in the abdomen, themselves curable by operation but not capable of X ray demonstration.

Carcinoma of the Stomach.

We now pass to a consideration of carcinoma of the stomach. The death-rate from this disease is unjustifiably high; yet it is safe to say that the greater part of it is preventable, since more than half the cases arise from a pre-existing chronic gastric ulcer. Early and efficient treatment of this condition will save many lives. In carcinoma originating without previous history of gastric trouble, the percentage of cases operable when first seen by the surgeon is appallingly low. This is not, in most cases, the fault of the patient, but of the profession. The patient usually seeks advice early enough, but the symptoms are so slight as not to be generally recognised and thus valuable time is lost. The usual history is that medicine is given, then a change of air ordered, or pyorrhœa is diagnosed and more valuable time wasted until the inevitable tumour can be felt.

There is only one safe rule—every case of digestive discomfort arising in an adult who has previously been in good gastric health, must be looked upon with suspicion. The first thorough examination will find or eliminate obvious causes—teeth, overwork, alcohol, disease of the genito-urinary or nervous systems—and the patient will be weighed. It is not humanly possible to examine by test and bismuth meals every case of this nature, but in those in whom thorough examination has revealed nothing to account for the symptoms these investigations should be done at once. In the remainder, what we consider the cause should be dealt with and treatment adopted for a month. If at the end of that time the patient is not well, sooner if he is not improving, test and bismuth should be given. In this type it is usual to find that free HCl is lost early, and that the total acidity is low. I consider this sufficient evidence to justify operation—if we wait for absolute certainty it usually means death to the patient. If an adult previously in good health develops discomfort after food, for which no cause can be found, and the test-meal reveals an absence of free HCl and a low total acidity, operation should be carried out without delay. Occasionally in growths near the pylorus there is, in the early stages, a great increase of gastric acidity; to know this should be sufficient.

I have never had an opportunity of seeing the result of X ray examination in an early case; at the time I most often see the patients the diagnosis is so obvious that it is usually a waste of time to have this done. It has been stated that X ray examination is useful in judging of the operability of a case of carcinoma of the stomach. This may be so in a few instances, but had I acted on this assumption many patients who are well to-day would have been dead or leading miserable lives as invalids. Never defer operation because it is the opinion of the X ray colleague that no growth is present or the case is inoperable. I have several times known cases of simple chronic ulcer returned from X ray examination with the definite diagnosis of inoperable malignant growth, and cases of carcinoma with the report "no evidence of any gastric lesion." A case should only be judged inoperable before opening the abdomen if enlarged glands are present above the left clavicle, or if rectal examination, which should be a routine in every abdominal case, reveals secondary deposits in the pelvis.

In the more common type of carcinoma, that following a many years history of chronic ulcer, the test-meal is of no value; the result is the same as that found in chronic ulcer without this complication. In the same way the opaque meal may not help—simply showing the crater of an ulcer or being returned as negative. This is as we should expect when we consider the difficulty even after the abdomen has been opened; in some cases it is only on microscopical examination that the diagnosis is made. It is the history that usually makes one suspicious that this complication may have occurred. After a period of years in which the patient has had attacks of pain at a regular hour after food, lasting meal after meal, day after day for weeks, with or without occasional vomiting, interspersed with periods of perfect or almost perfect digestive health lasting for months, an attack comes which, instead of passing away in the usual time, continues, or the symptoms alter, the pain becoming constant. Change in the nature of the symptoms, or their continuance, points to some complication having occurred, either adhesion to and erosion of neighbouring organs, particularly the pancreas, or the development of a stricture, hour-glass stomach, or the onset of carcinoma. X ray examination may help, but symptoms such as these mean that a long delayed and long necessary operation must be done.

Gall-stones.

Little help can be obtained in the diagnosis of gall-stones from X ray or pathological investigations. It may be possible in the future to say as the result of X ray examination that no stones are present, but this, although of value, would not exclude serious disease producing biliary colic. Many anomalous symptoms owe their origin to cholelithiasis; I have already mentioned attacks of pain in the left iliac fossa. I have published several cases in which the symptoms of carcinoma of the stomach were mimicked with exactitude; in gall-stones low gastric acidity is the rule and absence of free HCl common. Occasionally the regularity of the pain is such that the inevitable diagnosis is chronic gastric or duodenal ulcer. When we remember how frequently gall-stones are found complicating other abdominal diseases, the problem becomes more difficult. It holds a lesson for us all—never be content with the lesion found; if the condition of the patient will permit the whole abdomen must be examined. This warning is particularly necessary in dealing with disease of the appendix. No term has been more abused than chronic appendicitis; it has been made to cover many sins other than its own. Appendicular dyspepsia is a very real condition—diagnosable usually only by exclusion—and none of its symptoms are referable to the right iliac fossa. I teach at hospital that it is legitimate to diagnose appendix dyspepsia but not to act upon it. By this I mean that one should not in these cases remove the appendix through a small incision in the right iliac fossa: the whole abdomen should be exp'ored through a right paramedian incision in which the rectus is pulled out. By this method the size of the incision is of no moment in the strength of the abdominal wall after operation; the muscle falls back into its place and ventral hernia is impossible.

CONCLUSION.

I am afraid my remarks have been rambling, and for this I must apologise. I hope I have been able to point out a few of the great advantages of such departments as I have opened to-day in one small branch of surgery. Their utility, not only to the hospital, but to the whole district served is so great as to be inestimable.

The Milroy Lectures

ON

RESPIRATORY EFFICIENCY IN RELATION TO HEALTH AND DISEASE.

Delivered before the Royal College of Physicians of London

BY MARTIN FLACK, C.B.E., M.B., B.CH. OXON.,
WING COMMANDER, ROYAL AIR FORCE MEDICAL SERVICE.

LECTURE II.—(*Concluded*).*

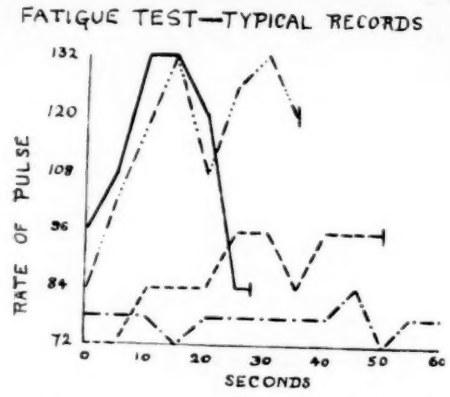
SPECIAL ROUTINE TESTS.

The Endurance or "Fatigue" Test.

THE test of sustaining 40 mm. of mercury with the breath held arose out of an endeavour to see if any noticeable fatigue could be elicited by getting the subject to blow every few seconds the mercury as high as possible, thereby getting a fatigue curve. This proved to be too wearisome, so the idea came to hold the mercury at a given height as long as possible. The height of 40 mm. was fixed upon, partly because certain subjects could not blow the mercury much above this height, but also because it was thought that this pressure, besides throwing a certain amount of work upon the expiratory musculature, would also cause a distinct but not unbearable or dangerous resistance to the circulatory through the lungs, thereby possibly giving value to the test as throwing light upon the circulatory condition of the subject. The idea of counting the pulse arose from this point of view, and it has proved to be a valuable adjunct to the test. The subject has no control over the behaviour of his pulse, and it has been found that the fit man differs very greatly from the unfit man in this respect. In the fit man the rate of the pulse every five seconds is not materially affected during the time that the mercury is sustained; in the slightly less fit the pulse rises gradually in rate until just before the end. The average time for the fit individual is 50 to 60 seconds. In a man probably unfit for flying, on the other hand, the pulse is immediately increased in rate and may stay so, with variations due mainly to error in counting by five seconds, as, for example, from seven per second before the test to 10, 11, 10, 11, 10, 9, 10 in five-second periods during the test. This type of response, however, is certainly not so definitely an expression of unfitness as one in which, after a transitory period of quickening, the pulse rapidly falls to the initial rate or even below. This type of response has been found to be associated with the most marked cases of flying strain. The length of time during which the mercury is supported is short, 15 to 25 seconds, and in that time the pulse-rate, in five-second periods, may vary from 96 per minute to 144 or 156 per minute and fall again to 72. Such cardio-motor instability is very

* Lecture I. and the first part of Lecture II. were published in THE LANCET of Sept. 17th and 24th respectively. Lecture III. will appear in a coming issue.

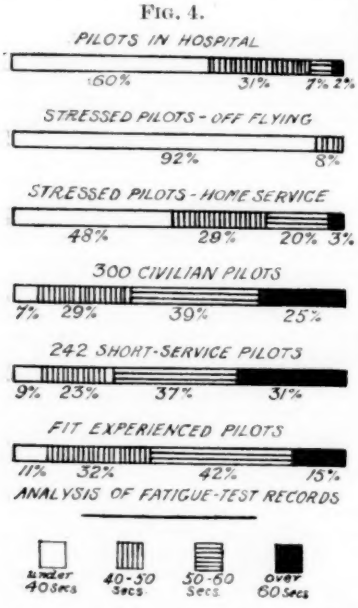
FIG. 3.



characteristic, and in all cases it is associated with marked flushing of the face and engorgement of the jugular veins, conditions which are not marked in the fit man. These forms of responses are charted in Fig. 3.

What exactly the test indicates it would be premature to try and say. More work is required on the exact physiological processes which are taking place. But a sufficient number of tests have been made as to the application to physical fitness and unfitness. The first standard for fitness for the test was set, as with the standards for other tests, by the examination of fit flying officers chosen by the executive, the standard for the tired and broken-down officer being similarly worked out. The remarks which have been made with regard to the breath-holding test—as to the test being in part a measure of the lung capacity for oxygen, as well as of the sensitivity of the subject to diminishing oxygen-tension—also hold good in respect of this test. So, too, does the comment as to the value of such tests in regard to the resolution of the subject. It is to be observed, however, that no matter how resolute a really unfit man may be, he will not be able to support the mercury for the time that a fit man does. Some figures concerning the application of the fatigue test have been given me by Lieut.-Colonel A. P. Bowdler, and they are charted in Fig. 4. It will be seen that, as with the breath-holding, pilots who may be said to represent the survival of the fittest—namely, successful demobilised flying officers, who wish to be granted short service commissions and other pilots desirous of continuing flying in commercial aviation—reach high standards on this test, in marked contrast to pilots who are on limited flying through stress or off flying altogether. It will be seen that, as with the breath-holding, the population of a hospital for flying patients has, on an average, a very poor capacity in this test. This is confirmed by the examination of over 400 for the records of both this and the breath-holding test.

FIG. 4.



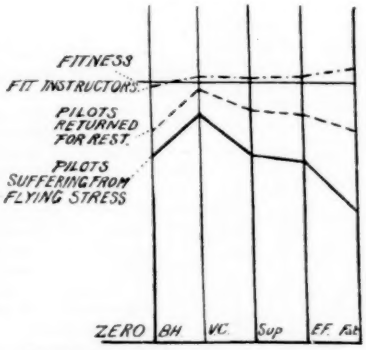
I will now give a few examples of the value of the tests considered as a whole; in assessing the physical fitness of the individual it must be remembered that in practice they are also employed in conjunction with other tests for circulatory efficiency and nervous stability. The normal standards taken for the tests may be summarised as follows: Breath-holding, 70 sec.; vital capacity, 4000 c.cm. (approx.);† supplemental air, 1600 c.cm. (approx.); expiratory force, 110 mm. Hg; 40 mm. Hg test, 50 sec. The falling away in efficiency due to flying strain may be shown shortly in the following table:—

TABLE III.

—	Breath holding in secs.	Vital capacity c.cm.	Supplemental air c.cm.	Expiratory force mm. Hg.	Fatigue in secs.
Fit instructors	69	4060	1620	112	52
Pilots returned for rest ..	57	3900	1400	95	40
Pilots broken down through flying strain	49	3480	1130	71	25

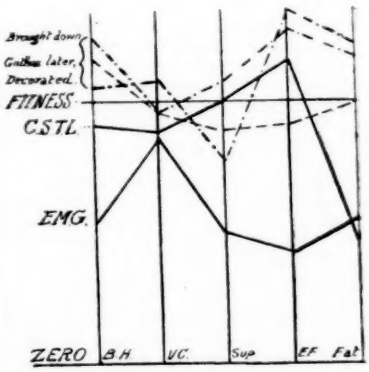
These are graphically recorded in Fig. 5; the value of the tests in overhauling an individual is shown in the results, which were obtained quite early during the time of working out the standards for the tests and of testing their possible value.

FIG. 5.



Graph showing how, in various respects, groups of pilots were below the normal line. B.H. = Breath holding. V.C. = Vital capacity. Sup. = Supplemental air. E.F. = expiratory force. Fat. = Fatigue.

FIG. 6.



Graph illustrating Table V.

The results in Table IV. were obtained at one of the first aerodromes visited for the examination of efficient flying officers. Through a misunderstanding all instructors were sent, and not the fit ones only. It will be seen from the results that the fit officers are easily distinguished from those who were either unfit for flying on medical grounds or who had been placed on limited flying or taken off flying for a rest by the executive.

Table V. shows results obtained at a home defence aerodrome where I had gone to obtain results from fit officers. On arrival there I was told that one

† These experiments were made before Dreyer's tables were available.

officer had developed "nerves" and had to be taken off, and that another was tired and was landing badly and was probably unfit to fly. I asked that they should be sent in with the other officers. From the results obtained the opinion was offered that No. 6 was the officer who had broken down, this on account of his poor performance in all the tests. In this case the small supplemental air is especially noticeable. No. 6, as the 40 mm. Hg test well shows, was the officer showing signs of early stress. With regard to the other officers, who were all very fit, it is interesting to record that three were subsequently

TABLE IV.

Initials.	Age.	No. of hours flying.	Maximum height. (Thousands of feet.)	Average height. (Thousands of feet.)	Breath held in secs.	Vital capacity.	Supplemental air in c.cm.	Expiratory force in mm. Hg.	Secs. of sustaining 40 mm. Hg by blowing.	Remarks.
H.	25	400	13	4	68	4400	—	150	58	Fit.
S.	23	150	15	5	71	4100	1900	100	55	,,
H.	21	70	11	4	64	3850	—	90	53	,,
D.	26	750	14	3	46	3600	1900	100	51	,,
H.	32	650	15·5	2	105	5020	1500	180	48	,,
M. C. ..	26	200	10	2	46	4000	1500	70	35	Unfit general service.*
S.	21	500	18	5	52	3700	1000	80	27	"Flying tired."†
P.	31	150	18	10	50	3700	700	80	27	Resting after high flying in France.
C.	24	150	18	3	65	4100	1200	65	25	Unfit general service.‡

* Gallipoli, enteric, dysentery, jaundice. † Now gets very tired after flying.
‡ Dysentery, enteric, jaundice; "flying tired."

TABLE V.

No. and initials.	Age.	No. of hours flying.	Maximum height. (Thousands of feet.)	Average height. (Thousands of feet.)	Breath held in secs.	Vital capacity in c.cm.	Supplemental air in c.cm.	Expiratory force in mm. Hg.	Secs. of sustaining 40 mm. Hg by blowing.
1. A. J. Q. B.	24 8 12	500	20	10	85	3800	1400	100	50
2. G. C. B. ..	24 11 12	220	17	4	92	3800	1700	140	57
3a.) C. S. T. L.	21 6 12	(125 o) (200 p)	22	13	63	3550	1600	125	23
*b.)					83	4400	1600	140	45
4. L. F. L. ..	19 6 12	95	17·5	6	70	4200	1800	125	53
5. R. G. H. A.	21 1 12	(120 o) (125 p)	16	5	85	4800	1800	90	68
6a.)					37	3600	750	45	23
†b. E. M. G. ..	26	(150 o) (150 p)	16·5	5	55	3700	1000	60	23
‡c.)					95	4000	1400	100	52
7. H. A. W. ..	19 2 12	120	19	10	73	4300	1200	145	59

TABLE VA.

R. G. N. ..	22 11 12	1500	23	10	110	4100	1750	60	28
					142	4100	1700	60	25§

* Two months later. † After two weeks rest. ‡ After four weeks rest. § Six weeks later after limited flying.

TABLE VI.

Initials.	Hours flown.	Breath held in secs.	Expiratory force in mm. Hg.	40 mm. Hg test.	Pulse response during test.	Official report.
R. H. W. ..	12 dual, 2 solo	40	60	20	96–132	No confidence.
C. S. W. ..	13 dual	45	70	50	84–120	Has lost confidence.
F. B. C. ..	4·43 ms. dual	25	100	33	96–132–108	Too nervous.
S. R. H. ..	6·20 ms. dual 15 ms. solo	35	60	25	84–132	Temperamentally unfit.
N. D. L. ..	1½ dual	37	80	23	108–120–72	Does not possess necessary confidence.
F. V. B. ..	5 dual	45	70	20	72–132–84	Extremely nervous.
J. L. A. ..	15·50 ms. dual	70	110	65	84–96–84	Erratic engine running.
A. W. G. ..	11·25 ms. dual	65	100	60	72–96–108	Cannot land.
D. W. P. ..	13 dual	85	100	56	72–108	No balance sense.
A. G. F. ..	18 dual	68	110	50	72–84–72	Bad landings.
G. W. W. ..	19·50 ms. dual	95	100	45	84–108	Heavy on controls.
A. C. B. ..	10 dual	65	100	68	72–108	Slow to learn, bad turns.
	Fitness average =	70	110	52	—	—

TABLE VII.

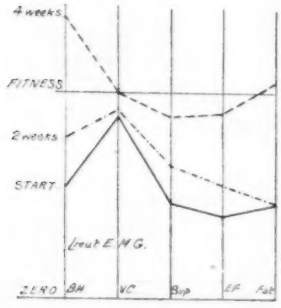
Initials.	Breath held in secs.	Expiratory force.	40 mm. Hg test.	Pulse response during test.	Remarks.
S. W. G. ..	50	70	35	72–96–72	Sent for report on physical fitness. ? Smoking too much.
G. W. ..	42	60	25	96–120–84	Gassed 1915; short of breath on exertion.
E. A. B. ..	40	50	15	108–132–96	Fainted while marching.
W. H. C.	10*	30	15	72–144–72	Dizziness on exertion. History of pneumonia and pleurisy in the army.
C. J. ..	43†	110	25	84–108	Breathlessness after influenza and pneumonia.
G. G. O. C.	42	60	15	96–108–84	Vital capacity 1750; general debility; always ill at school.
W. G. W. ..	30	70	20	84–108–72	Blown up by shell 1915. Now (1918) dizzy and headaches in the morning.
T. G. H. ..	60	80	35‡	84–108–96	Neurasthenia.
C. J. B. R. ..	40	70	15	72–96	Breathless on exertion. Pneumonia three months ago.
R. H. W. ..	25	80	20	108–132–84	"Short of breath." ? Gastritis. Had "cold" at the time of examination.

* "Made him buzzy." † "Dizzy." ‡ "Head swimming."

decorated for bringing down Gothas which were raiding London. Fig. 6 illustrates Table V.

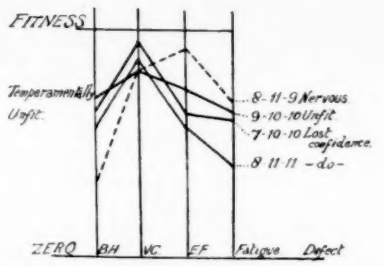
As showing the value of treatment, rest, and open-air exercise, I give (3a and 6b and c) the results obtained some time later upon the non-efficient officers. The progress of recovery of physical efficiency of Lieutenant E. M. G. is seen in the graph (Fig. 7). Although he recovered to this extent physically it is worth recording that he continued to suffer for a time from "anxiety neurosis." As regards the value of the test in assessing physical efficiency, it is interesting to compare the result in these cases with that of R. G. N. (Table VA.), who, although advised to give up flying for the time, asked to be allowed to continue to fly on limited flying. At the end of six weeks he returned stating that he felt that he could not continue flying any longer and that he would be glad to get away from it for a time.

FIG. 7.



Other examples could be given of similar cases which were met with during the period of investigation of the tests. That such a condition is not necessarily due to the length of time of flying indulged in is well seen in Table VI. which is taken from the results of over 300 officers or cadets examined during their period of training. All were found unsuitable for further flying, but it is noticeable that those who had developed nerves or lacked confidence and did not wish to continue flying present a marked contrast in physical efficiency to those who had no air sense, who were heavy on controls, or who made bad landings,

FIG. 8.



Note.—The figures in the "fatigue" column in this and the following graph indicate variation in pulse-rate for five seconds (½ min.) during the fatigue test—e.g., 8–11–9 means that the pulse in five-second periods started at 96 per minute, went up during the test to 132, and fell again to 108.

FIG. 9.

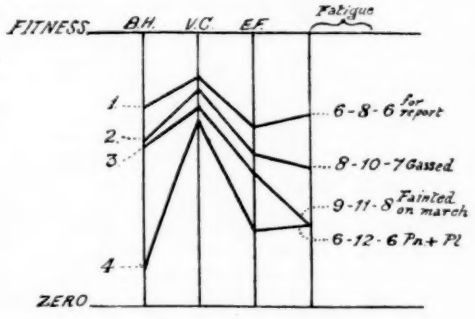


TABLE VIII.

Initials.	Age.	Breath held in secs.	Vital capacity in c.cm.	Supplemental air in c.cm.	Expiratory force in mm. Hg.	Secs. of sustaining 40 mm. Hg by blowing.
G. E. B.	17 11/12	55	4200	1300	80	42
W. D. H.	17 11/12	84	4300	1800	60	25
J. McK.	18	53	3700	1700	55	32
H. G. R.	18	66	3800	1650	130	30
H. B.	17 11/12	53	2800	1000	60	25
R. R. S. A. ..	18	48	3600	1650	70	27
W. M.	17 11/12	44	3400	1600	120	35
R. C. T.	18	85	2750	900	100	28
F. R.	19	50	3100	1000	60	20
D. H.	19	63	—	—	60	40
C. T. M. H. ..	19	42	3800	—	40	33
F. W. C.	22	61	4100	—	100	30
F. C. B.	23 2/12	63	4300	1800	60	35
F. R. B. W. ..	21 6/12	55	4100	1700	80	37
C. T. Y.	18 2/12	48	3800	1700	100	35

and were disappointed at being "stood off" from flying.

The falling away in efficiency of four of these subjects is shown in the graph (Fig. 8).

A similar condition of inefficiency may arise in cadets who have never been near an aerodrome, but who either have not sufficient physical stamina for military training or who have been debilitated by illness. The figures in Table VII. are taken from the records of 54 cadets reported upon before being posted to an aerodrome.

Cases 1–4 are graphically represented in Fig. 9 in such a manner that the falling away from standard in these tests is well demonstrated.

Finally, as showing that a similar condition of bodily inefficiency may be found among individuals who are deemed more or less normal members of the community, I give the results obtained during the period of experiment upon the tests by the examination of a number of individuals (mostly youths of 17 to 19 years) who, being conscripted for military service during the war, presented themselves for an opinion as to their suitability for aviation. (Table VIII.)

Candidates 1 to 11 had already been rejected by the medical examiners before the tests were taken. In candidates 12 to 15 an opinion was asked for by the assessor, who, although he did not feel the candidates were suitable, was unable to give an exact reason for this opinion. It is seen that in these four cases the tests afforded valuable help in indicating the physical inefficiency of the subjects in question.

COVENTRY AND WARWICKSHIRE HOSPITAL.—On Sept. 21st the general committee of the Coventry and Warwickshire Hospital, faced with a bank overdraft of £36,216 and an average working loss of £1000 a month, decided that in view of the present decline in income drastic economic action was necessary. The only possible course appeared to be the closing down of one block of the hospital, known as the White Wards, and this was reluctantly agreed upon. The number of beds will be reduced by 66, and a considerable saving will be effected in expenditure on account of staff and overhead charges.

THE DISASTROUS RESULTS OF CERTAIN ABDUCTION FRACTURES OF THE ANKLE-JOINT.

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A SEQUENCE of consultations on the disastrous results of the surgical treatment of a fracture of the ankle-joint which I described for the first time very many years ago has impelled me to write the following short paper on the subject, since the mode of production of this fracture and its characteristics seem to have escaped the attention of the surgeon. As a consequence it receives no efficient treatment, with the unfortunate result that the patient is rendered permanently lame since little or nothing can be done to remedy the disability after the lapse of some weeks or months. I call attention to the details of this fracture with less hesitation since, with the exception of the writings of Dr. Artemio Zeno, the distinguished professor of surgery of the Litoral University of Rosario, I do not think I have ever seen the method of its treatment correctly referred to. It is certainly not an uncommon fracture, while the deformity and disability that is associated with it are most distressing. I called it the "third degree of abduction fracture of the ankle-joint." Many years have elapsed since I dealt with the mechanics of the ankle-joint, which were incorrectly described in anatomical text-books, when I showed that under the term Pott's fracture two distinct and opposite conditions were comprised. They were the results of an excessive amount of force applied to the ankle-joint in the positions of adduction and abduction. All these results had been blended into one confused mass by Pott and by the surgeons who followed him, while in anatomical and surgical works impossible diagrams were inserted to illustrate what was supposed to represent a Pott's fracture. The treatment of these fractures by splints was based largely on the supposed accuracy of these diagrams and was consequently comparatively futile. I note that the more recent editions of such books as Gray's Anatomy have discarded the ridiculous old diagram employed to illustrate Pott's fracture and have replaced it by a rough compromise. I will therefore make no apology for referring in some detail to the conditions which result from excessive adduction and excessive abduction of the ankle-joint.

Degrees of Adduction.

If the foot is *adducted* with a force greater than the skeleton is able to bear two varieties of fracture may result:—

(1) The direct impact of the facet on the inner aspect of the astragalus upon the internal malleolus results in a more or less vertical fracture of the tibia, the line of fracture passing upwards in such a direction as to carry away the internal malleolus and a triangular area of the shaft of the tibia. As this fragment is displaced upwards the gap between the malleoli is widened and the grip of the tibia and fibula upon the astragalus is rendered less secure than it was. (See Fig. 1.)

(2) If forcible adduction be continued after the internal malleolus has been broken, strain is exerted through the external lateral ligament on the outer malleolus sufficient to break the fibula transversely over the lower end of the tibia. The fibular fracture is usually somewhat scrunched. (See Fig. 2.)

It is obvious that should any difficulty be experienced in placing the fragments in either of these fractures in accurate apposition, the best possible result can be obtained by securing the internal malleolus in position by means of a plate and three screws, an operation which makes little demand on the skill of the surgeon. At the worst, except in a few cases, neither of these fractures is followed by serious disability.

Degrees of Abduction.

If the foot is *abducted* with a force greater than the skeleton can bear, fractures of three degrees of severity may ensue.

(1) In this movement, the areas of the articular surface of the ankle-joint which sustain the greatest pressure are the anterior portions of the facet on the external malleolus and on the astragalus. In consequence of this pressure on the front of the malleolus a *torsion* fracture of the fibula results. The situation of this fracture may vary within wide limits; it is never transverse, as originally described and illustrated diagramatically in the text-books, but is very oblique, or in some cases nearly vertical. If the fracture extends through the malleolus there may be no displacement of fragments, and the injury may only be seen in a radiogram taken from side to side. In no case of suspected abduction fracture should the surgeon be satisfied to express an opinion solely from the examination of a radiogram taken from before backwards. If the fracture be through the shaft of the fibula above its articulation with the tibia the displacement may be very considerable and correspondingly difficult to replace.

FIG. 1. FIG. 2.

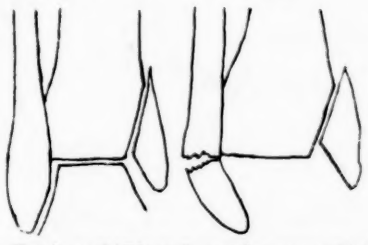

FIG. 1.—Fracture of tibia and carrying away of internal malleolus as a result of direct impact of facet on inner aspect of astragalus upon internal malleolus.
FIG. 2.—Forcible adduction being continued after breaking of internal malleolus, fibula breaks transversely over lower end of tibia as result of strain exerted through external lateral ligament on external malleolus.

(2) If the foot is displaced still further outwards strain is exerted through the internal lateral ligament upon the internal malleolus, which may be broken transversely. Occasionally the ligament may be ruptured instead.

These two fractures are met with fairly frequently. In many instances the displacement is trivial, and in most a moderately good result may be obtained by splinting, controlled by radiography. When the surgeon is unable to bring the fragments into reasonable apposition and to retain them—especially in patients in whom a joint affording a normal security is of great importance—the exposure of the fibular fracture, the accurate restoration by means of traction and forceps of this bone to its normal form, and its retention by means of a plate and four screws gives a perfect result. The internal malleolus falls automatically into position and does not require to be fixed by a plate. The exception to operative measures is when the patient is old or alcoholic and the bone is very fragile or severely comminuted. The difficulty that this particular fracture presents is that the lower fibular fragment consists of a long sharp spike, extending upwards and backwards, which has to be fitted and secured to the end of the shaft of the fibula.

(3) If the foot is abducted with still greater force the pressure exerted on the lower fragment of the fibula may by its strain upon the interosseous ligament tear off a wedge-shaped area of the lower end of the tibia of variable size having its base downwards. This fragment includes a varying proportion of the articular facet on the tibia. The ends of the shafts of the tibia and fibula are displaced forwards, the former resting upon the neck of the astragalus and upon the anterior portion of its tibial facet, while the

lower fragments of the tibia and fibula are carried back with the displaced foot, both fragments forming a large open angle with their corresponding shafts. (See Fig. 3.)

Disastrous Third Degree.

This last is the fracture to which I now wish to call particular attention. My experience of the treatment of this fracture, of which very many cases have passed through my hands since I first recognised it early in my career, is that it is very often impossible to replace and retain the fragments in accurate apposition by means of manipulation and splinting alone. That this is certainly the experience of others is fair to assume

FIG. 3 represents diagrammatically the relations of the broken bones to the foot at time of receipt of the injury.

from the conditions presented by those cases which have come under my observation some months after treatment. As far as I could gather from the history of these patients, they were regarded as ordinary examples of Pott's fracture, and were all subjected to the process of so-called "setting" which entailed the administration of an anæsthetic. The limb was

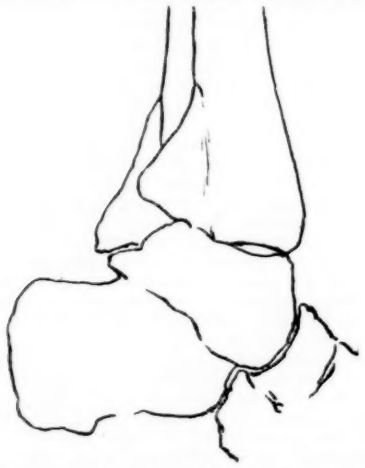

FIG. 4 shows the relationship of the bones to the foot after several months have elapsed since the receipt of the injury. The front of the tibia has formed a new joint with the upper aspect of the head of the astragalus, while the fragments of the tibia and fibula have blended together to form an irregular mass which no longer permits of free flexion and extension of the ankle-joint. The articular surface of the astragalus has also undergone extensive changes in form.

then put up in a splint and a perfect result was promised. Some were radiographed subsequently, but no mention was made to the patient of any residual displacement, if it was observed, and certainly no effort was made to rectify it.

It is unfortunate that once the fragments of the tibia and fibula have united in their displaced position the possibility of separating the tibial fragment and of restoring it to its normal position is very small. This is due to the fact that the end of the tibia has formed for itself a new joint with the upper surface of the neck of the astragalus and the adjacent portion of the tibial facet on the astragalus, while the fibular and tibial fragments, having united with the shafts, articulate with the rest of the facet on the astragalus—which has become much altered in form—with the process of bone behind it. (See Fig. 4.)

In the other varieties of adduction and abduction fractures it is usually possible by operation to replace the inner malleolar and fibular fragments in their normal position and to restore the function of the joint. In this particular fracture the presence of the displaced tibial fragment forms what is practically an insuperable obstacle.

Surgeons have no valid excuse for the very disastrous results that follow these methods of treatment, since it is possible to obtain excellent radiograms in most places in the country. What has puzzled me is that none of these unfortunate patients had resorted to the law courts, although the failure of the surgeon to perform his duty is only too obvious to the meanest intelligence, in view of the facility with which radiograms can be obtained by patients in the present day.

Treatment.

Apart from cases in which the bones are fragile and comminuted from advanced age or prolonged alcoholic excess, this fracture can be dealt with successfully by operation. A vertical incision exposing the fibular fracture enables the surgeon by suitable manipulation to restore the fragments of the fibula to their normal relationship. The accurate adaptation of the fibular fragments entails that of the tibial fragment, since the fibular fragments cannot be approximated unless the tibial section fits into the gap in the tibia. The fragment of the internal malleolus also falls automatically in position and remains so. The fibular fragments can then be secured accurately in position by means of a plate and four screws, supplemented in a few instances by the use of an encircling loop of steel wire.

Much of the difficulty and failure which the surgeon experiences in the treatment of fractures is due to the fact that while in his preliminary studies he is called upon to acquire a transitory knowledge of much that is relatively useless to him in the efficient performance of his profession, the fundamental principles of mechanics upon which a knowledge of the function of the skeleton and soft parts and of the treatment of the variations they undergo from injury or disease is absolutely essential, are excluded from his education. The fault lies not with the surgeon but with the teacher.

NUTRITION AND GROWTH ON DIETS DEVOID OF TRUE FATS.

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AND

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THE question as to whether fats are or are not necessary components of the diet of higher animals has always presented great interest to physiologists, but in spite of much research work and many theories no definite answer has as yet been given. As was pointed out by Drummond (1919) no solution of this problem was possible until it had been found practicable to separate the so-called fat-soluble vitamin from the true fats, because experiments of long duration—and experiments only extending over a period of a few days are useless in this study—in which diets nearly or wholly devoid of fats have been given, have of necessity entailed the absence of adequate amounts

of the associated vitamin, and therefore the results obtained are not free from complications which arise from this cause.

The absence of the vitamin A from the diet of animals induces an abnormal condition which may be recognised by certain symptoms, and in the paper referred to above it was shown that there was no appreciable difference in the type of symptoms, or in the time which elapsed before they appeared, in groups of animals fed on diets deficient in this vitamin with or without true fats. This was taken as indicating that true fats may be dispensable components of the mammalian diet provided that a sufficient supply of calories is given in other forms. The next step was obviously to attempt to feed animals on diets which would supply the requisite amount of the accessory vitamin, but which were devoid of free fats. Experiments on these lines, however, demanded that a natural source of the vitamin A containing no fat should be discovered, or that a method of separating the growth-promoting substance from the fats in which it naturally occurs should be found.

Conclusions Drawn from Preliminary Work.

During the last two years attempts have been made by us to accomplish both these tasks. In a former preliminary communication before the Physiological Society (1920) it was shown that by employing an extract prepared from carrots it was possible to supply the vitamin in a palatable form without, at the same time, giving more than minute traces of glycerides. Experiments were made with this preparation, and it was found that young rats will live and show growth for several months on diets freed from all but very small traces of fat. Allowing for the small amount of fat in the extract from carrots it was estimated that the animals received about 14 mg. of true fats per day in an average ration of 15–20 g.

The results were, however, regarded as preliminary, partly because normal growth was not obtained, and also because a certain amount of true fat was being given. The conclusions drawn from the results were summed up in the following statement:—

> "Unless this minute amount of fat plays as important a rôle in the metabolism of the organism as do the minute quantities of such substances as the accessory factors, it is reasonable to suggest that pure fats are dispensable constituents of the mammalian diet."

Since this work was carried out we have devoted further attention to this question, and as we have now succeeded in separating the vitamin from every trace of true fats we have at last been able to study the problem adequately. It is interesting to note that very shortly after the preliminary results were published by Drummond some very similar experiments were described by Osborne and Mendel (1920), who obtained good growth on diets containing mere traces of true fats and whose conclusions were almost identical with our own: "if true fats are essential for nutrition during growth the minimum necessary must be exceedingly small."

The Separation of Vitamin A from Fat.

McCollum and Davis (1914) first stated that the vitamin found in butter fat would resist saponification processes applied to the fat, but this observation was not confirmed by Drummond. More recently, however, it has again been asserted by Steenbock and Boutwell (1920) that a fraction from the unsaponifiable matter of certain oils contains the vitamin. When this latter paper appeared we had ourselves just completed another study of the question, and had found that the negative result previously reported by Drummond was probably due to destruction of the active substance by contact with air, and that if such contact is prevented the activity passes into the unsaponifiable fraction of the fat. We have found it possible to prepare extracts of extraordinary potency from fish liver oils and from green plant tissues by this means, of which a fuller account will be given later.

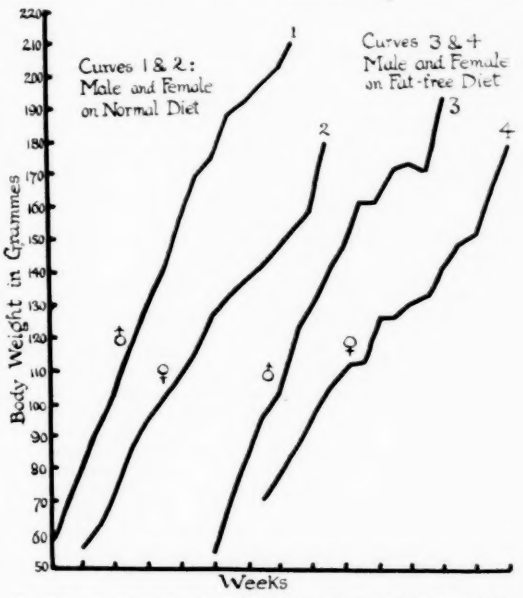
The possession of such material made it possible at last to test satisfactorily the problem of the dispensability of fat, since it was practicable to compound an artificial diet supplying all the known dietary essentials but devoid of neutral fats. The preparation of the constituents of the diet was the subject of great care. The protein (caseinogen) and the starch were rendered as free from fat as is possible by repeated and prolonged extraction with hot alcohol and ether, and so far as we are aware the only chance of the diets containing any trace of fat was from the inclusion of yeast extract as a source of the vitamin B. The ether extract of this product was, however, found to be almost negligible—0·08 per cent.—of which less than half was true fat.

Feeding Experiments.

The composition of the two dietaries used by us was as follows:—

	Normal diet.	Fat-free diet.
Caseinogen	20	20
Starch	50	65
Purified fat (tristearin)	15	0
Yeast extract	5	5
Lemon juice	5	5
Unsaponifiable matter from fish liver oil	0·02–0·04 g.	0·02–0·04 g. per day
Mixture of salts	5	5

The two dietaries were given daily in the form of food pastes made up with water, except for the unsaponifiable matter, which was given as a daily supplement, as is our custom. Young rats as soon as weaned were placed in groups on these two rations and have been under close observation ever since. The experiments have now been running for several months and the progress of the two groups has been parallel, apart from the fact that the few deaths which have occurred were of animals on the fat-free



Growth curves of young rats fed on a normal diet (1 and 2) and a fat-free diet (3 and 4).

diet. The food consumption of both groups has throughout been good, and no abnormality has as yet arisen which could be attributed to the absence of fats. Naturally the group on the fat-free diet consumes a larger amount of food daily, since this is necessary to ensure the requisite calorific intake.

Animals from each group have from time to time been killed and submitted to post-mortem examination, but without any abnormality being detected. The amount of body fat in those on the fat-free rations was normal. Several animals in both groups have

now reached maturity and it is hoped to continue the experiment further to ascertain whether any remote effects of the deficiency of true fats may be observed by changes in the capacity to breed and rear the young. The fact that we have obtained normal growth in rats from weaning to maturity on diets deprived as far as possible of all traces of neutral fats indicates that this class of foodstuff is not essential to the nutrition of these animals. (Growth curves in Figure.)

It is not intended to review the whole subject here, since the results will be published in a more complete form later. We may emphasise the truth of the remarks made by Osborne and Mendel in the paper to which we have referred, on the confusion which has arisen in the literature on this question through failure to recognise the disturbing factor introduced by the association of the vitamin with some fats and not with others. Our results support one opinion held by Hindhede (1920) who claims that fats are dispensable provided that a sufficient supply of vitamins is ensured.

Summary.

Young rats have been grown from weaning to maturity on diets, deprived as far as possible of neutral fats, and have shown normal development and behaviour. It is intended to ascertain whether the capacity for breeding and rearing the young is in any way inhibited by such diets.* More deaths were encountered amongst the animals on the fat-free diets than amongst those receiving fats. It would appear that neutral fats are, from a purely physiological standpoint, dispensable constituents of a diet, provided the other foodstuffs supply a sufficiency of the vitamin frequently found in association with natural fats. The real value of fats as convenient sources of energy is obvious.

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A NOTE ON THE USE OF SULFARSENOL IN THE TREATMENT OF CONGENITAL SYPHILIS.

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MOST workers will admit that salvarsan or one of its allies along with mercury is the treatment par excellence for all manifestations of syphilis, especially of congenital type. Statistics have been published of cases treated at the Royal Hospital for Sick Children, Glasgow, which show a fall in the death-rate since the advent of salvarsan.[1] In pre-salvarsan days the mortality among children under 3 months old was 71 per cent., and after the introduction of salvarsan and kharsivan it was reduced to 26 per cent. Unfortunately, in order to avoid pain or sloughing of the tissues, it has been necessary to give these preparations of arsenic intravenously, and the difficulty of such a procedure has considerably limited its use.

Recently, however, sulfarsenol—a drug which can be given intramuscularly without causing either pain or sloughing—has been put on the market, and at first it seemed to give equally good results. Attention was drawn to this fact by Dr. Leonard Findlay[2] in the discussion on congenital syphilis at the Royal Society of Medicine in February, 1921, but more extensive experience has unfortunately considerably modified this opinion. In children treated with sulfarsenol the manifestations of the disease quickly disappear if doses equal to those employed with kharsivan (0·12 to 0·2 g.) are given, and the general condition of the children improves remarkably; but if the crucial test, the Wassermann reaction (W.R.) is employed, then the results do not compare at all favourably with those obtained earlier with kharsivan and neokharsivan.

For example, 35 children have now been treated with intramuscular injections of sulfarsenol and mercurial inunction. In order to compare the results with those published for kharsivan the children have been divided into two groups: (1) children under 1 year of age; and (2) children over 1 year of age.

As is shown in the table (Group I.), 19 children received from 7 to 9 injections and a negative Wassermann reaction was obtained in 8, or 42 per cent. Four children received from 10 to 18 injections and in one a negative W.R. was obtained. Thus in 9 of the 23 children under 1 year of age—i.e., in 39 per cent., a negative W.R. was obtained, but in 14, or 60 per cent., it remained positive after from 7 to 18 injections had been given. The figures given by Dr. Findlay for kharsivan indicate much better results. A negative W.R. was obtained in 64 per cent. of his cases after a course of 9 or fewer injections.

GROUP I.—*Children Under 1 Year of Age* (*23*).

No. of cases.	No. of injections.	Average No. of grammes of drug given in each case.	W.R.	
			+	−
13	7	1·06	8	5
4	8	1·05	2	2
2	9	1·41	1	1
1	10	1·42	1	—
1	12	2·04	—	1
1	15	2·76	1	—
1	18	1·95	1	—
Total 23	—	—	14	9

GROUP II.—*Children Over 1 Year of Age* (*12*).

1	3	0·72	1	—
1	4	1·92	1	—
1	5	2·40	1	—
1	6	1·44	1	—
5	7	1·48	5	—
1	12	3·12	1	—
2	15	5·92	2	—
Total 12	—	—	12	—

In Group II., of 12 children over 1 year old (five of whom had previously been treated with neokharsivan) none gave a negative W.R. after from 3 to 15 injections of sulfarsenol, whereas among Dr. Findlay's cases over 1 year old treated with intravenous neokharsivan a negative W.R. was obtained in 50 per cent. Among the 35 children treated with sulfarsenol and mercury only one death occurred, and it was due to bronchopneumonia.

These results suggest that the intramuscular injection of sulfarsenol is not as efficacious in producing a cure of congenital syphilis, as evidenced by the W.R., as intravenous injection of kharsivan. Whether the virtue in the latter method lies in the drug per se or in the method of administration (intravenous as against intramuscular) we are at present unable to say. On the other hand, the work of Harrison, White, and Mills[3] seems to show that intramuscular injection of neosalvarsan or its substitutes is more efficacious in producing a negative W.R. than intravenous injection of these drugs. In these cases, however, a very much larger dose was given intramuscularly than intravenously, and they did not attempt to determine the relative efficacy of the various arsenical preparations they used.

* Since this was written the animals in both groups have reproduced, and several healthy normal litters of young have been reared by the females on the fat-free diet, as well as by those on the more normally-balanced ration.

[1] Findlay, L.: Syphilis in Childhood, Oxford Univ. Press, 1919, p. 143.

[2] Findlay, L.: Proc. Roy. Soc. Med., xiv., No. 8.

[3] Harrison, L. W., White, C. F., and Mills, C. H.: Brit. Med. Jour., 1917, i., 569.

COPPER IN TUMOURS AND IN NORMAL TISSUES.

BY CHARLES POWELL WHITE, M.A., M.D.CAMB., F.R.C.S. ENG.

(*From the Helen Swindells Research Laboratory, University of Manchester.*)

DURING an investigation of the amount of phosphorus and calcium in tumours it was noticed that on evaporating to dryness an acid extract of a carcinoma and igniting the residue, the ash was distinctly of a blue colour. This colour was easily shown to be due to the presence of copper. I proceeded therefore to examine other tumours and normal tissues for the presence of copper, and to estimate the amount present. The method of treating the material was, briefly, to extract the dried tissue successively with boiling $CHCl_3$ and warm 1 per cent. HCl. The acid solution was used for the estimation. Examination of the insoluble residue in several cases did not show the presence of any copper.

The estimation was eventually carried out by a colorimetric method, using a Dubosc colorimeter. The delicate colour tests for copper are :—

1. The brown colour formed on evaporating to dryness a solution containing bromide of copper. This is probably the most delicate test for copper, but is not easily adapted for quantitative work. It was noticed in every case during the preparation of the material.
2. The purple colour formed on adding a solution of formaldoxime to a solution containing copper. This is a very delicate test, but the colour is apt to change and it is not therefore adapted for use in a colorimeter.
3. The red colour produced by adding a copper salt or metallic copper to a solution of a morphine salt containing H_2O_2 and NH_3. This test for morphine was discovered by Dr. T. H. Oliver (1914 [14]) working in my laboratory, but a similar test had previously been described by Denigés. It will detect 0·01 mg. of copper in about 10 c.cm. of solution, but the test is not adapted for colorimetric work as the depth of colour is not proportionate to the amount of copper and the colour is not permanent.
4. The pink colour of cupric ferrocyanide. This is useful for colorimetric work, but there are difficulties in its use which will be described below. It was used to a large extent.
5. The brown colour of cuprous sulphide. This also was used.
6. The blue colour of ammonio-cupric solutions. This was noticed in each case during the preparation of the material, but is not of sufficient delicacy for the present investigation.

Two main difficulties were experienced in using the ferrocyanide test. First, in the solution to be tested the cupric ferrocyanide tended to separate out as a precipitate, instead of remaining in colloidal solution as it did in the standard solution. This difficulty was partly overcome by the addition of a little gum arabic, but it remained a difficulty and in some cases prevented an accurate comparison. The other difficulty was that the pink colour in the solution to be tested often diminished or disappeared in a short time. This disappearance was shown to be due to the oxidation of the ferrocyanide to ferricyanide, but the cause of this oxidation was not detected. It did not occur in the standard solution. This difficulty was overcome by the addition of a reducing substance. Glucose and formalin were tried, but their action was too slow. Phenylhydrazine hydrochloride (1 per cent.) was immediately successful and was frequently used, and eventually a saturated (4 per cent.) solution of hydrazine sulphate was used as being a cleaner substance to work with than the phenylhydrazine hydrochloride. Lehmann (1897 [12]) also met with this difficulty and traced it to the presence of HNO_2. He overcame it by the addition of urea.

Owing to these difficulties with the ferrocyanide test the later estimations were made with the sulphide. Comparisons between the two methods showed that they gave the same results, being of about the same order of delicacy, an amount of 0·1 mg. in 15 c.cm. of solution giving a sufficient colour for comparison.

Details of Method.

The method in detail was as follows :—

The acid (1 per cent. HCl) extract of the tumour or other tissue having been evaporated down to known volume, usually 100 or 200 c.cm., a definite amount—25, 50, or 100 c.cm.—was taken and evaporated to dryness in a silica dish, the residue being ignited. The ash was dissolved in dilute HCl and the copper precipitated with H_2S. The precipitated sulphide was dissolved in bromine water, and the filtered solution evaporated to dryness on a waterbath, a little H_2SO_4 (0·5 c.cm. of N/2 solution) being added before drying. The residue was dissolved in a little water and a drop of $FeCl_3$ solution added, and then excess of NH_3. The solution was filtered from the precipitate of $Fe(OH)_3$ and the filtrate again evaporated to dryness with the addition of a little H_2SO_4 before drying. The residue was then ready for estimation. The two methods employed were as follows :—

A. The residue was dissolved in a little water and filtered. One c.cm. of 1 per cent. potassium ferrocyanide, 1 c.cm. of saturated hydrazine sulphate (or of 1 per cent phenylhydrazine hydrochloride), and a little gum arabic added, the whole being made up to known volume, usually 15 c.cm.

B. The residue was dissolved in a known volume of water and the solution saturated with H_2S.

The standard solution contained one part Cu in 10,000 of water and was prepared by dissolving the equivalent quantity of $CuSO_4\ 5H_2O$ in water. It was tested against a solution prepared by dissolving 1 g. of electrolytic copper in HNO_3 and diluting to 5000 c.cm. One to five c.cm. of the standard solution were used for each test, the same reagents being added as to the solution to be tested, and the whole made up to known volume with water. It is convenient but not necessary to make the standard solution up to the same volume as the solution to be tested. The two solutions are then introduced into the receptacles of the colorimeter and a series of readings (usually 15 or more) taken, the mean of the series being taken as the result.

All reagents used, and the air of the laboratory, were tested for the presence of copper with negative results, except in the case of the hot water supplied to the laboratory. This contained a fraction of a milligramme per litre. This hot water, however, was not used except occasionally for washing apparatus. The method of estimation proved very accurate when tested with different known solutions of copper. As a test for the method in the presence of organic matter 5 c.cm. of the standard solution (0·5 mg. Cu) were added to 1600 c.cm. of urine. A subsequent estimation after evaporating to dryness, &c., gave 0·55 mg. Cu (and urine itself may contain copper). In another test in which 0·2 mg. Cu were added to 500 c.cm. of urine the amount found was 0·21 mg.

One possible source of fallacy when the sulphide method is used is the possible occurrence of lead. Most of the lead would be removed in the process (by H_2SO_4 and NH_3) but traces might survive, as it appears almost impossible to separate the last traces of lead from copper. An experiment was carried out in which 5 c.cm. of the standard solution and a considerable amount of lead acetate were added to 500 c.cm. of urine. The result was an apparent excess of Cu in the final estimation to the extent of 0·06 mg. (0·56 instead of 0·50), and this excess may have been due to the copper in the urine. There was, however, no reason to suppose that any of the material examined contained lead. This source of fallacy does not occur in the ferrocyanide method, but in the latter especial care must be taken to remove the last traces of Fe.

Results.

Coming now to the results, every specimen examined (over 100 in all) contained copper with the exception of one specimen of urine and one sample of egg white (No. 78). In this latter case the eggs had been boiled hard before drying, and the albumin dried into a very hard horny mass which yielded little to the acid solution. Examination of the insoluble residue in this case showed the presence of traces of copper. The negative results in these cases tend to confirm the general reliability of the method.

The results are given in the table expressed as milligrammes Cu per kilo. of the fresh or dry weight. They show that copper is present in tissues to a greater extent than is usually supposed. As a general rule there was not a sufficient amount of material to allow of a repetition of the estimation but, where possible, this was done. Some of these duplicate estimations are given in Table I.—e.g., No. 21.

The 24 specimens of tumours examined show a great variation in Cu content, with a minimum of

TABLE SHOWING AMOUNT OF COPPER IN TISSUES.

No.	Tissues.	Milligrammes copper per kilo. Fresh.	Dry.
	Tumours.		
1	Squamous carcinoma, neck	—	83·0
2	Spheroidal Carc. Liver (primy. tonsil)	4·9	37·1
3	Spheroidal Carc. Stomach	9·84	60·1
4	Spheroidal Carc. ,, (secy. nodule)	—	255·0
5	Columnar Carc. Rectum	—	65·1 / 76·2
6	Columnar Carc. Gall bladder	5·9	19·0
7	Columnar Carc. Kidney	10·8	77·7
8	Spheroidal carc. Breast	6·3	28·0
9	Spheroidal carc. ,,	—	121·0
10	Spheroidal carc. Axillary glands (primy. breast)	—	250·0
11	Spheroidal carc. Breast	—	113·2
12	Spheroidal carc. ,,	7·6	30·3
13	Spheroidal carc. Liver (primy. breast)	—	61·6
14	Spheroidal carc. ,, ,, ,,	6·15	50·4
15	Spindle-celled sarcoma, groin	—	38·5 / 37·6
16	Round-celled sarcoma, cervical glands	2·21	14·9
17	Lymphocytoma, axillary glands	7·8	50·0
18	Melanotic sarcoma Liver (primy. skin)	60·2	262·0
19	Melanotic sarcoma Ox	—	30·3
20	Fibroid (*a*) Uterus	—	77·7
21	Fibroid (*b*) ,,	—	38·9 / 36·7 / 40·8
22	Dermoid cyst Wall	—	84·4
23	Dermoid cyst Contents (*a*)	—	36·5
24	Dermoid cyst Contents (*b*)	—	155·0
	Mean	12·17	79·7
	Alimentary Canal.		
25	Mucous membrane Stomach (carc.)	13·9	81·5
26	Mucous membrane Small intestine (normal)	5·0	39·6
27	Mucous membrane Colon (normal)	17·2	101·5
28	Mucous membrane Rectum (carc.)	—	501·0
29	Wall of colon (sepsis)	8·3	82·0
30	Muscular coat Small intestine (normal)	1·78	17·2
31	Muscular coat Colon (normal)	5·55	34·4
	Mean	8·62	122·5
	Uterus.		
32	Uterine wall (*a*) (Fibroid case)	—	65·6
33	Uterine wall (*b*) ,, ,,	—	27·6
	Liver.		
34	Sepsis	19·1	169·0
35	Fatty (CHCl$_3$ poisoning)	—	32·2
36	Normal	—	49·3
37	Normal Pityriasis	8·6	40·7
38	Normal Previous carc. breast	—	45·5
39	Normal Lupus carc. of neck	13·2	49·2
40	Normal Sarcoma of tonsil	6·25	27·0
41	Contained metastases Carc. of tonsil	6·0	28·7
42	Contained metastases ,, ,, breast	13·4	81·3
43	Contained metastases ,, ,, ,,	17·9	50·4
	Mean	12·0	57·3
	Kidney.		
44	Sepsis	5·6	52·8
45	Normal	3·7	18·5
46	,,	7·6	36·9
47	,,	7·4	41·2
48	Pityriasis	—	17·7
49	Previous carc. of breast	50·6	173·0
50	Lupus carc. of neck	9·2	56·6
51	Carc. of breast and liver	10·4	66·5
	Mean	13·5	57·9
	Spleen.		
52	Sepsis	60·4	177·5
53	Normal	12·0	64·7
54	,,	—	89·5
55	,, pityriasis	—	38·8
56	Previous carc. of breast	19·6	53·0
57	Lupus carc. of neck	7·6	43·2
	Mean	24·9	77·8
	Pancreas.		
58	Sepsis	7·5	62·5
59	Pityriasis	—	63·0 / 140·6
	Mean	..	55·4
	Lung.		
60	Carc. breast	7·5	40·5
	Heart.		
61	Sepsis	9·4	65·1
62	Normal	3·3	17·8
63	,,	3·5	12·9
64	Lupus carc. neck	8·8	50·0
	Mean	6·25	36·5

AMOUNT OF COPPER IN TISSUES—*continued.*

No.	Tissues.	Milligrammes copper per kilo. Fresh.	Dry.
	Viscera (of Bantam).		
65	Melanotic sarcoma, jaw	10·5	52·7
	Calcified Glands.		
66	Carc. of breast	278·0	432·0
67	,, ,, tonsil	8·7	18·2
	Ribs.		
68	Rib Normal	52·7	140·0
70	Rib Carc. of breast, left	95·0	253·5
71	Rib ,, ,, ,, right	121·0	223·5
72	Rib ,, ,, ,,	60·6	147·2
73	Costal cartilage, carc. of breast	48·5	160·5
74	Rib Carc. of breast, left	210·0†	694·0†
75	Rib ,, ,, ,, right	78·5	215·0
	Mean of six (omitting 74)	76·05	189·8
	Various.		
76	Milk (cow)	3·5(l)	30·2
77	Blood (sheep)	7·3(l)	37·4
78	Egg White	0·0†	0·0†
79	Egg ,,	1·3	11·1
80	Egg Yolk	—	3·4
81	Egg ,,	5·0	10·1
82	Egg Shell	—	73·0
83	Oyster shell	43·8	63·7
84	Oysters	96·4	407·0
85	Nux vomica (seeds)	—	97·9
86	Cardamoms	—	96·2
87	Oats	—	80·8
—	Bread (*a*)	—	10·3
—	,, (*b*)	—	21·4
—	Beef steak (*a*)	—	28·3
—	,, ,, (*b*)	—	29·8
(16)	Rabbit	9·4	46·0
(6)	,,	2·9	11·8
(9)	,,	—	39·0 / 33·6 / 33·8 / 44·2
(8)	,,	58·2	301·0
(12)	Mouse	130·0	431·0
	Urine (3 different samples)	0·2 / 0·15 / 0·0 (l)	

(l) = Litre.

14·9 and a maximum of 262·0 mg. per kilo. of dry tumour. This variation cannot be correlated with any distinct differences in the nature of the tumours, except that those which are most degenerated tend to show a larger amount of copper. For instance, Nos. 1, 4, 9, 10 (mean Cu = 177·0) showed a considerable amount of degeneration, while Nos. 2, 6, 12, 15, 16, 17 (mean Cu = 32·5) showed very little. Nos. 20 and 21 were from different portions of the same fibroid (total weight over 18 lb.) and Nos. 32 and 33 were from corresponding portions of the uterine wall in the same case. The two specimens of the tumour and the two portions of the uterine wall show somewhat similar differences in Cu content. The two specimens of dermoid cyst contents, Nos. 23 and 24, were from different portions of the same cyst. No. 23 being from a hæmorrhagic area and No. 24 from an area which was largely necrotic and contained a large excess of calcium. This necrotic area contained a large amount of copper.

In the specimens of alimentary canal the most striking feature is the large amount (501) in the mucous membrane of the rectum. This was taken just above a carcinoma (No. 5) and there was a very small amount available, so that there is probably a large error. The amount of copper, however, must have been great to enable it to have been estimated at all. Possibly the copper is excreted by the large intestine, as is calcium.

The ten specimens of liver examined show with one exception (No. 34) less variation than the tumours or the alimentary canal. The kidneys show practically the same average amount as the liver. Here again there is one specimen (No. 49) with a content very much higher than the rest, and this is not from the same case as the liver with the high content (No. 34). The spleens again show one specimen with a high content (No. 52) from the same case as liver No. 34.

The average amount of copper in the spleen is higher than that in the liver or kidney. The ribs show a uniformly high copper content (189·8). The large amount in No. 74 is probably an error. A second estimation showed a very much smaller amount, but there was not sufficient material to allow of a third estimation.

The last part of the table shows the copper content of various substances for comparison. An interesting point is the high content of egg shells and the closely similar content of oyster shells. Possibly the copper may be concerned in the shell pigments. Another interesting point is the similarity of the three seeds: nux vomica, cardamoms, and oats. In the case of the rabbits and mice the material examined was the acid extract of the whole animal. In the three specimens of normal urine about two litres was used each time. Since this work was done I have found copper in nine other specimens of normal and nephritic urines.

Recorded Estimates of Copper in Tissues of Vertebrates.

Few estimates of the amount of copper in the tissues of vertebrates have been recorded. I have not had access to the original communication by K. B. Lehmann (1895[11]) but his figures are partially quoted in Oppenheimer's "Handbuch" and also by Yagi (1910[16]). Comparing the figures for the liver and kidney (human) with my own expressed as milligrammes per kilo. of fresh weight, we have—

	Lehmann.	Yagi.	White.
Liver	3·75 ..	11·52 ..	12·0
Kidney ..	1·73 ..	3·24 ..	13·5

It will be seen that as regards the liver my figure agrees very well with that of Yagi and both are considerably higher than that of Lehmann. I have found much more copper in the kidneys than either of the other two observers. Yagi suggests that the reason why his figures are higher than those of Lehmann is to be found in the more extensive use of copper cooking vessels by the Japanese. My figure for oysters (96·4 mg. per kilo. fresh) agrees exactly with that found by Dubois (1900[7]), which was 96·5.

Possible Significance of Copper Content of Tumours.

As this investigation was mainly of a preliminary nature directed towards finding out whether the copper content of tumours differed from that of other tissues and how widely copper was distributed in the organism no definite conclusions can be drawn as to the significance of the presence of copper in the higher animals. While it has been known for a long time that copper plays an important physiological rôle in some of the invertebrata, especially molluscs and arthropoda, its presence in the higher animals has usually been regarded as an accident, and of no physiological importance except that it enters into the formation of the pigment turacin of birds' feathers, in which copper exists in combination with hæmatoporphyrin (Laidlaw, 1904[10]). Similarly, its presence in plants is attributed to accident and in pharmaceutical preparations it has been attributed to the use of copper vessels in manufacture. It is possible, however, that copper may have a physiological action as a catalyser. In the morphine reaction described above Oliver (1914[14]) found that during the reaction the morphine is destroyed by oxidation and cannot be again recovered. He also determined in the course of further investigations (unpublished) that copper salts give the reactions which are usually relied on to detect the presence of oxidases (guaiac and indophenol reactions).

The presence of an increased amount of copper in degenerated tumours suggests either that the degeneration is associated with an increased catalytic action due to the increased amount of copper, or it may be that copper, like calcium, tends to be deposited in degenerated areas. The question whether or not copper is of physiological importance in the higher animals and plants must thus be left for future investigation. The universal distribution of copper and its presence in seeds, eggs, and fœtal tissues as well as in adult organisms would seem to point to its being something more than an accident. In man it has been found in fœtal as well as in adult livers (Bergeson and d'Hôte, 1875[1]) and, indeed, in larger quantities in the fœtal organ than in the adult (v. Itallie and v. Eck, 1913[9]).

Distribution of Copper in Animal and Vegetable Organisms.

As copper is present in wild animals and in animal and vegetable foodstuffs its presence in man cannot be attributed wholly to the use of copper vessels, &c.. The distribution of copper in the animal and vegetable kingdoms appears to be universal, so far as it has been looked for. According to the above investigations it is present in man, cattle, sheep, fowls, rabbits, and mice, and also in oats, nux vomica, cardamoms, and bread. It has also been described in fish (Dubois, 1900[7]), whales (Dougal, 1911[6]), dogs, cats, horses, swine (Lehmann, 1895[11]), in numerous plants—e.g., belladonna, colchicum, ergot, digitalis, sarsaparilla, thuja, oats, cardamoms, wheat, buckwheat—and in pharmaceutical preparations (Lehmann, Lewis, 1914[13] and others). In the lower animals, in which it exists for the most part as entering into the composition of a respiratory pigment, it is present in cœlenterata, echinoderms, crustacea, molluscs, insects, &c. (Dubois, 1900[7]). It has also been found in the eggs of some of these—e.g., sepia (Dhéré, 1900,[3] 1901[4]) and lobsters (Dougal, 1911[5]).

Another metal which appears to be universally present in the animal and vegetable kingdoms is manganese. The presence of this metal has been studied especially by Bertrand, who with Medigreceanu (1912[2]) examined 150 specimens from 15 species of vertebrates and found manganese present in all except in the white of birds' eggs. Bertrand is of the opinion, based on experiments on aspergillus and other organisms, that manganese is of considerable physiological importance. In my material I tested for manganese in 24 cases taken at random (including seven tumours) and found it present in all, but I did not estimate the amount.

Summary.

1. Copper appears to be universally present in the tissues of animals and plants so far as it has been looked for.

2. The known catalytic action of copper and the presence of copper in seeds, eggs, and in fœtal as well as in adult tissues, suggest that it has a physiological significance.

3. Copper is present to a greater extent in degenerating tumours than in those which are not degenerated.

This work was carried out in connexion with the Christie Hospital, Manchester, and the Pilkington Cancer Research Fund.

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LITERARY INTELLIGENCE.—Messrs. E. and S. Livingstone have undertaken the British and Colonial Agency of the American *Medical Record*, and offer specimen copies to intending subscribers. Annual subscription, including postage, is 33s., and should be sent to 17, Teviot-place, Edinburgh.

PRESENTATION TO A MEDICAL MAN.—Dr. T. Glyn James, of Pontypool, has been presented with a cheque for 100 guineas by the workmen of the Pontnewynydd Sheet Galvanising Works in recognition of his work as president of the Works Distress Fund.

Clinical Notes:
MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

A CASE OF
LUPUS-EPITHELIOMA TREATED WITH RADIUM.

BY F. JOSELIN JAUCH, M.R.C.S., L.R.C.P. LOND.,
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Lupus vulgaris sooner or later tends to heal finally, but the condition sometimes persists despite treatment. Even so, and especially if the diseased part is irritated or injured, an epithelioma may develop; the latter usually runs a rapid course owing to the good vascularisation of the tissues, and treatment is very difficult. The case described is illustrative of these points, an apparent cure being effected by the energetic use of radium.

Mrs. N. F., aged 61, was admitted to the cancer wing of the Middlesex Hospital at the beginning of November, 1920, with the following history: At the age of 6, the patient had a discharging swelling on either side of the face in the malar region, which, on treatment at various hospitals, gradually disappeared, leaving a certain amount of scarring behind. During the whole of her life, however, it appears,

Before treatment with radium. After treatment.

she was never quite free from one or two small discharging ulcers which broke down periodically. She also complained of a stiff ankle and deformed wrist, which on examination proved to be the site of an old tuberculous disease. In January, 1920, the patient accidentally scratched the diseased tissue over the left malar region with a comb. Subsequently an ulcer formed at the site of injury, which was treated with a "burning liquid." The edge of the ulcer began to grow, and its increase was accompanied by shooting pains radiating to the top of the head, and a copious offensive discharge. The growth encroached upon the left eye, giving rise to a great deal of pain here. She had been admitted to a surgical ward in September, 1920, but was discharged as the condition had progressed too far for operation.

On examination, the patient's general condition was rather poor; the bridge of the nose was very depressed, and covered, as were both cheeks, with papillomatous elevations of lupus, the scarring of which had caused ectropion of the lower eyelids, especially of the right. On the left malar and temporal region was an oval mass of growth, 1½ in. by 2½ in., ulcerating in the centre, firmly fixed to the subjacent structures, with hard raised edges and an irregular surface, and having a copious and offensive discharge. It encroached upon the orbital cavity, displacing the eye backwards and inwards, having destroyed a considerable portion of the lower eyelid by its growth. The eye was subject to fairly marked conjunctivitis, and vision was very poor on this side. The diagnosis of lupus-epithelioma was made and confirmed histologically. No enlarged glands were palpable. The Wassermann reaction was negative.

The treatment was commenced on Nov. 13th, 1920, and consisted in the application of 1 mm. screened radium in tubes, applied to the surface and periphery of the growth, with a rubber protective between the two; the latter, however, was later discarded. The first dose consisted of 284 mg. of radium applied for 10 hours. The amount and time of exposure, however, were later increased, as I found that the radium in smaller quantities stimulated the growth to further activity. Necrosis of the growth took place after six weeks' treatment, the slough separating on Jan. 7th, 1921, and local recurrences were dealt with by further applications of both screened and unscreened radium, in all 12 323 mg.-hours of radium. The pain gradually lessened and practically disappeared. Unfortunately, it was found necessary to remove the left eye on account of panophthalmitis on Feb. 14th. On the 28th the papillomatous elevations on the nose and cheeks had completely disappeared and the epithelioma had been replaced by healthy granulations; when the patient was seen in April there was no evidence of a recurrence, though the area was subject to lymphatic œdema.

For permission to publish this case I am indebted to Mr. W. Sampson Handley, surgeon to the Middlesex Hospital, under whose care the case was admitted.

A CASE OF
LABIO-GLOSSO-LARYNGEAL PARALYSIS
SUCCESSFULLY TREATED BY VACCINE.

BY J. C. VOIGT, M.D. EDIN.

THE rarity of this disease, and the fact that practically all authorities on labio-glosso-laryngeal paralysis are agreed in describing its causes as unknown, and its prognosis as hopeless, give interest to the following case.

At Easter, 1920, a lady, who, during 30 years has been a patient of mine whenever she was resident in Southport, and attended by Dr. L. D. Temple of Rock Ferry when she lived in that district, came to see me complaining of bronchitis and nasal catarrh. The "cold" from which she was suffering appeared to me of the mild influenza type—if influenza can ever be described as mild. When she was breathing in, I noticed a peculiar occasional sound, half-wheezing, half-sighing, sometimes followed by a rasping clearing of the throat.

I saw the patient again on Sept. 15th, at her home in Birkenhead, where she had been under the care of Dr. Temple since the early part of August. The first symptom had been a difficulty in swallowing, then dribbling of saliva from her mouth, difficulty in articulation of linguals and labials, and inability to blow her nose, which felt "closed up." These symptoms had become progressively worse, until when I saw her with Dr. Temple, on the 15th, a continuous stream of saliva was running from her mouth, and she had constantly to dry her lips with wool. She could only swallow liquid food, and that with difficulty; her speech was very indistinct.

We agreed that since extensive pyorrhœa alveolaris complicated an apparent acute case of labio-glosso-laryngeal paralysis in which the œsophageal muscles were failing in sympathy with those of the larynx, skilful nursing was a first necessity. Circumstances did not permit the patient's removal to a nursing home; so after seven weeks in the Royal Infirmary, Liverpool, she was placed under my care in Southport.

What struck me as most noticeable now was her mental depression and apathy. She could swallow soft foods better than liquids; but the dribbling of saliva from her mouth was worse and her speech was very difficult to follow. Her pulse was small and frequent. Her senses of taste and smell were both affected, and these facts, together with a history of four definite attacks of influenza, led me to resolve to try a treatment of vaccine of *B. influenzæ* (with pneumococcus for prophylaxis). On account of the myocardial weakness, I put her on full doses of liquid extract of fresh green kola nut with Peruvian bark and glycerine. To correct intestinal stasis she had 3½ gr. of phenolphthalein nightly, and during the first week 1/60 gr. strych.-sulph. hypodermically every day. I determined to attempt an improvement with blended vaccines, and on Dec. 1st she was given hypodermically a vaccine injection of:—

B. influenzæ	..100 million.	*Staph. aureus*	.. 30 million.
Pneumococcus	.. 50 „	Streptococcus	.. 20 „

This mixed stock vaccine was gradually increased in strength until the dose was:—

B. influenzæ	..500 million.	*Staph. aureus*	..100 million.
Pneumococcus	..200 „	Streptococcus	.. 60 „

This was at the end of January, 1921, by which time all the teeth except seven had been extracted, and there was marked general improvement. Swallowing had become easy, articulation improved, and salivation stopped. Treatment with an autogenous vaccine of *Staph. aureus* kindly made for me by Dr. T. Jorkes, Department of Pathology, St. Bartholomew's Hospital, was now commenced (first dose 100 million). The pus from which this was prepared was collected for me from the roots of freshly extracted teeth and conveyed to Dr. Jorkes by Dr. Reginald Hilton, also of St. Bartholomew's Hospital. The mixed stock vaccine was used alternately with the autogenous vaccine, and the interval following any one injection was four or five days. This was in February, and by the end of the month the patient was able to whistle and articulate perfectly, and was in fact apparently quite cured.

Up to date there has been no return of symptoms, and last month the patient increased in weight by half a stone.

Southport.

GAERTNER MENINGITIS COMPLICATING GAERTNER ENTERITIS.

BY JOHN SMITH, M.B. ABERD., D.P.H.,
BACTERIOLOGIST, CITY HOSPITAL, ABERDEEN.

CASES of Gaertner enteritis complicated by development of Gaertner meningitis appear to be extremely uncommon; after an extensive search of the literature only one such case is described as having occurred. This case is mentioned by Worster-Drought and Mills Kennedy[1] in their book on cerebro-spinal fever. Records of sporadic Gaertner infections are also infrequent. Thus Savage[2] instances three cases; two recorded by Batten and Forbes (1908) occurred in infants, the chief symptoms being diarrhœa and vomiting, both terminating fatally. The third case recorded by Dean[3] (1911) occurred in an adult who had no symptoms of food poisoning, but who had a suppurative cholecystitis from which *B. enteritidis* of Gaertner was isolated. Rosher and Wilson[4] describe a fourth sporadic case which simulated typhoid fever. McNee[5] records a fifth case which was at first suspected to be a case of cerebro-spinal fever, and which later developed marked signs of pulmonary involvement. It appears, therefore, that only one case of Gaertner enteritis complicated with meningitis, and five sporadic cases of Gaertner infections, are described in the literature on this subject. Accordingly it has seemed desirable to record the following case:—

A. B., a male child, aged 5 weeks, admitted to hospital on Dec. 2nd, 1920.

History.—The child had been ill for a fortnight previous to admission. During that time the chief symptoms were diarrhœa and vomiting, with considerable pyrexia. On Dec. 1st slight head retraction was observed.

Condition on Admission.—Temp. 99·2° F., pulse 160, resp. rate 50; head retraction very marked, the anterior fontanelle bulging, and Kernig's sign present.

Course of Illness.—On the 3rd temp. rose to 101°, and from this point onwards child became progressively worse. Convulsions were frequent, and the child died on the 7th, five days after admission.

Cerebro-spinal Fluid.—Lumbar puncture was performed on admission and on four subsequent days. The first three punctures yielded a total of 110 c.cm. cerebro-spinal fluid. The fourth and fifth punctures yielded no fluid.

Bacteriological Diagnosis.—The fluid obtained at the first lumbar puncture was turbid, and when allowed to stand in a test-tube a distinct deposit was formed. The globulin tests of Noguchi and Ross-Jones showed a great increase above normal in the amount of globulin present. After standing one portion of the fluid overnight a pellicle formed. The pellicle was suspended in the centre by processes projecting from the periphery, and was very similar in appearance to that obtained in tuberculous cerebro-spinal fluids. Smears made of the deposit after centrifuging and stained by Gram's method showed the presence of numerous Gram-negative organisms, mostly extracellular. Some of the organisms were definite bacilli, others were almost coccal in shape. A differential cell count showed that 90 per cent. of the cells were polymorphs, and 10 per cent. small lymphocytes. Agar slopes and plates of trypagar,[6] containing hæmolysed blood, were inoculated and incubated overnight. On both slopes and plates numerous discrete colonies were obtained. The colonies consisted of Gram-negative bacilli.

The biochemical reactions of the organism were then investigated, and it was found that mannite, glucose, dulcite, maltose, galactose, and lævulose were fermented, while there was no change produced on lactose, saccharose, salicin, and raffinose. Litmus milk showed at first a slightly acid reaction, but later became markedly alkaline. No clot formed. Indol was not formed. The organism was motile. Agglutination tests were made, using *B. paratyphosus A*, *B. paratyphosus B*, and *B. enteritidis* of Gaertner agglutinating serums. The tubes were incubated in a water bath at 55° C. for two hours, and read after standing for quarter of an hour. It was found that the organism was agglutinated to the limit of the titre of *B. enteritidis* of Gaertner serum, and not by a dilution of $\frac{1}{100}$ *B. paratyphosus A*, and *B. paratyphosus B* agglutinating serums. Cultures were made from the fluid obtained at the second and third lumbar punctures. The same organism was present.

Post-mortem Examination.—The child showed no marked signs of wasting. The lungs were congested. Heart normal; stomach and intestines showed little macroscopic pathological change. Mesentery congested, mesenteric glands much enlarged. Liver enlarged and friable, showing marked signs of fatty degeneration. Spleen normal in appearance; kidney showed both cortex and medulla to be pale.

Pia-arachnoid, on opening of the cranium, found to be much congested. Sulcii filled with purulent exudate, most marked at base, especially left base. Superficial part of brain substance hyperæmic. Ventricles distended, containing blood-stained purulent fluid. Spinal membranes also showed an acute leptomeningitis. MacConkey plates were inoculated with material from intestinal contents, liver, spleen, and with heart blood, and pus from the brain. Typical *B. enteritidis* of Gaertner, fulfilling all the biochemical and agglutination reactions, were obtained from all these sources.

Source of Infection.—Not determined. No other cases of Gaertner enteritis were discovered in association with the case, and the five immediate contacts of the patient gave no history of any enteric infection. Samples of fæces obtained from all these contacts gave on examination for *B. enteritidis* of Gaertner negative results.

Feeding.—Previous to becoming ill the child had been fed on diluted cow's milk; after the onset of the illness a concentrated milk product had been substituted.

Conclusion.—It is evident from the clinical and bacteriological findings that this was a case primarily of Gaertner enteritis as indicated by the presence of diarrhœa and vomiting; by the isolation of the Gaertner bacillus from the intestine, liver, and spleen; and by the absence of meningeal symptoms during the first fortnight of the illness. Thereafter there was an extension of the infection to the meninges.

References.—1. Worster-Drought, C., and Kennedy, A. Mills: Cerebro-Spinal Fever, p. 335. 2. Savage, W. G.: Food Poisoning and Food Infections, p. 66. 3. Dean, G.: Jour. of Hygiene, 1911, xi., p. 259. 4. Rosher, A. B., and Wilson, G. Selby: THE LANCET, 1921, i., 16. 5. McNee, J. W.: THE LANCET, 1921, i., 218. 6. Med. Res. Report, No. 50, p. 16.

COLONIAL MEDICAL COUNCIL.—The South African *Union Government Gazette* announces that Dr. Arnold Hirst Watkins has been elected President of the Colonial Medical Council, with effect from August 31st, for the remainder of the period of office expiring on Dec. 31st, 1921, vice Dr. Charles F. K. Murray, resigned.

GOVERNMENT POSTS FOR WEST AFRICAN DOCTORS. We understand from *West Africa* that the Secretary of State for the Colonies has agreed to the creation of six posts in the Gold Coast Medical Service for West Africans possessing qualifications entitling them to be placed on the Medical Register of the United Kingdom. The salary attached to these posts will be at the rate of from £500 to £700 a year. An allowance, in lieu of quarters, at the rate in force for European officials will be granted, with the option of free Government quarters when such quarters are available. Pensions will be the same as those enjoyed by other African members of the Government service under the Pensions Ordinance. The duties of the African medical men, whom it is thus proposed to appoint to the Government service, will, unless an emergency should arise which rendered it necessary to employ them for other purposes, be entirely concerned with the indigenous population, and more especially with the poorer classes, and they will usually be stationed away from large towns. They will, as a general rule, be allowed private practice.

Reviews and Notices of Books.

DISEASES OF THE NEW-BORN.

By Dr. AUGUST RITTER VON REUSS, Director of the Department for the New-Born at the First University Women's Clinic in Vienna. London: John Bale, Sons and Danielsson, Ltd. 1921. With 90 illustrations. 52*s.* 6*d.*

THIS book was published in Vienna in 1914 and we owe the war, therefore, a still further grudge for the delay of seven years before the translation reaches this country. Without doubt it is a book of great importance, which deals more thoroughly with the subject of the new-born than any we can call to mind. Only two points suggest criticism. The first is that the title does not suggest at all adequately how much the book contains of value and interest to the general practitioner. It should, we agree, be read as a matter of course by every one who already has a special interest in obstetrics or pædiatrics. But the title will not do much to encourage its circulation beyond that point. This is unfortunate, for the author takes a wide view of his subject, and the book contains a valuable section on the physiology of the new-born, an equally good one on breast nursing, while the premature child and its needs are ably discussed before the subject suggested by the title is reached. There follows an account of birth injuries, of diseases of individual organs and systems, and of congenital malformations. The hæmorrhagic diseases are fully treated, and the chapters on acute and chronic infections are good.

The second and more material complaint arises out of the extreme anxiety of Dr. von Reuss to acknowledge throughout the text every authority with whose writings his industry has brought him into contact. There is a bibliography at the end of the book wherein some 1800 publications are mentioned and this is all to the good. But the tiresome honesty which sees fit to load almost every sentence with a host of names is utterly ruinous to literary style. It may be considered captious to criticise a habit, the lack of which we often condemn in French writers, but in a text-book of this type some collect in acknowledgment of sources of erudition at the end of each chapter would make the volume much more readable. There are passages in this book which read like a Parliamentary division list. Why should it be thought necessary, in a short sentence on infections of the salivary glands, to state that Messrs. Hennig, Mikulicz, and Kümmel differ in their views from Messrs. Nobécourt-Hutinel, Hofstaelter, Auerbach, and Bretschneider? And in the next sentence there are inflicted on the reader the names of the bacteriologists who have isolated different organisms in this complaint. Perhaps, too, irritation is somewhat increased by the rarity of an English name. In the whole bibliography there seem to be only about 40, and of these about half are American. Dr. von Reuss might reply, one fears with some truth, that there are not a great number more who could serve his purpose.

One turns with relief from many of the author's introductions to reach his summaries of evidence. For these are clear, well written, and convincing. Certainly one feature of this book, and one of the most valuable, would be hard to seek in any English or American study of infancy, even one concerned with the new-born. This is the section on lactation and breast nursing. There are here 61 pages devoted to breast feeding and the conquest of its difficulties, and but four to artificial feeding. Space in an exactly opposite proportion is usually allotted to these aspects of the subject in our text-books. Where else could be found so stimulating a confession as "Our experience concerning the artificial feeding of new-born children is somewhat scanty .... with regard to artificial feeding in the first week we know exceedingly little." We fear to think of the fate of medical student or pupil midwife in 1914 in this country who reached a final examination in this condition of praiseworthy ignorance. Yet Dr. von Reuss was specially appointed to teach midwives in the obstetric clinic in Vienna on the feeding of infants.

The English edition has been prepared under the supervision of Dr. J. D. Rolleston, who has revised the translation. This is throughout exceedingly well done. The illustrations are good, and we hope a new edition may contain many more. The book is a mine of information.

Physiologie normale et pathologique du Nourrisson. By E. LESNÉ and LÉON BINET. Paris: Masson et Cie. 1921. Pp. 297. Fr.18.

THIS volume, which is the joint work of a physiologist and of a clinician, embodies a summary of the facts known as to the general physiology of the infant in health and disease, forming what is practically a monograph on the subject. Although reference is made to the work of more than 700 authors—including, however, very few English names—the volume consists largely of the results of personal researches undertaken by MM. Lesné and Binet themselves.

In an introductory chapter the authors point out that while the anatomist and the pædiatrist have studied the new-born infant each from his own point of view, the physiology of the suckling has hitherto received no such specialised attention, the present volume being an attempt to supply the lack. The 17 chapters deal with the blood; the circulatory, muscular, nervous, genital and urinary systems; respiration, digestion, and nutrition; thermometry and calorimetry; growth, muscular movement and the special senses; and the means of defence possessed by the organism. It will be seen that the range of subjects is very wide, and the authors having correlated with these studies various pathological considerations, the book is one that will appeal with some force to the general practitioner. Certain controversial statements appear. Among the many contra-indications to suckling given are included all organic affections of the nervous system as well as most of the neuroses, while, on the other hand, erysipelas in the mother, which von Reuss considers an absolute contra-indication owing to the high susceptibility to it of the infant, is not here regarded as a bar. In discussing the question of the transmission of tuberculosis by cows' milk it is stated that even sterilised milk from tuberculous cows will, owing to its content of dead tubercle bacilli, cause cachexia and death in a young animal; while a further statement in the same section that the question of the identity of the bovine and the human tubercle bacillus is still sub judice will not be endorsed by all bacteriologists. An index would add materially to the value of the book. These, however, are minor blemishes in a work of unusual merit and completeness, in which the whole subject is handled with a scientific knowledge and thoroughness entitling the volume to a place in every medical library.

HYPNOTISM AND SUGGESTION.

Treatment by Hypnotism and Suggestion, or Psychotherapeutics. Seventh edition. By C. LLOYD TUCKEY, M.D. Aberd. With a Chapter on Treatment by Suggestion during the War, by A. PERCY ALLAN, M.D., B.S. Lond. London: Baillière, Tindall and Cox. 1921. Pp. 413. 21*s.*

Dr. Lloyd Tuckey's well-known volume on treatment by hypnotism and suggestion appears in a seventh edition, proof of its continued usefulness over more than 30 years and of the fact that psychotherapy needs no stimulus from war experience to justify its worth in clinical medicine. There are, of course, other forms of psychotherapeutic treatment than hypnotism and suggestion, and though the chapter formerly contributed by Dr. Constance Long and dealing with psychoanalysis is now omitted, this is not because of the author's lack of sympathy with the latter but solely

owing to his recognition that it has a literature of its own. As befits a veteran in his subject, Dr. Lloyd Tuckey feels that much of what he used to preach has become of general acceptance and can be omitted; nevertheless, the reader will still derive benefit from a perusal of the history of the question and from the records of old experiments now rather relegated to the class of *vieux jeux*. On the whole, notwithstanding the excellence of the clinical record here reported in considerable detail, we are not able to dispel the feeling that the methods of actual hypnotism are of somewhat limited applicability, though for suitably selected cases recourse might be had more often to its therapeutic aid.

ADVANCED SUGGESTION (NEURO-INDUCTION).

Second edition. By HAYDN BROWN, L.R.C.P. Edin. London: Baillière, Tindall and Cox. 1921. Pp. 402. 10*s*. 6*d*.

SOME two years ago we reviewed the first edition of this book, in which the principles of psychotherapy by suggestion are elaborated along lines commending themselves to its author. The second edition contains three new chapters and is otherwise amplified and modified. In our view, Dr. Haydn Brown is on much surer ground when he expounds the practical value of his particular technique than when he endeavours to propound psychological "laws" to explain its action. Reduced to its lowest terms and stripped of the peculiar terminology which is employed ("synapsis is the process of convection from neurones to neurones, through synapses,") the method appears to consist in the attainment of "automatic relaxation, both of body and mind," whereupon "the sensible words you say to the patient will henceforth continue to claim his interest right through, provided they are of the slightest value to him." As far as we have noticed, however, notwithstanding a chapter on technique, the author nowhere appears to vouchsafe simple, definite information as to the production of this ideal state of automatic relaxation; in fact, he admits candidly that "I am no better able to tell a medical man what I do than a golfer can by mere words tell another how to play the game." In his hands, to judge by the records of this book (and who can tell what virtue there may not be in the handling of a treatment-hardened neuropath or psychopath by a "new" process, or at least by a process for which there is a new name?), the method of suggestion in psychotherapy has proved conspicuously successful. As in many other instances, we are convinced it is the man behind the method who, by his justifiable self-confidence and his practice of several golden rules (to our mind perhaps the most useful and practical paragraphs in the book), is able to impress his patient, to his lasting benefit.

EXAMINATION OF MENTAL CASES.

Examen des Aliénés. Nouvelles Méthodes Biologiques et Cliniques. By ANDRÉ BARBÉ, Médecin Aliéniste des Hôpitaux de Paris. With a Preface by Dr. SÉGLAS, Physician to the Salpêtrière. Paris: Masson et Cie. 1921. Pp. 178. Fr.8.

THIS little handbook is intended to assist the alienist in the objective examination of mental cases; it is a kind of vade mecum of such methods of clinical pathology as are likely to prove of service to the student of mental disease. Accordingly we find by far the larger portion of the book taken up with the cerebro-spinal fluid, the blood, the urine, the circulatory system, and the ductless glands; the space devoted to psychological investigation is trifling by comparison, psycho-analysis being dismissed in a page and a half. In fact, the book rather belies its title, though the aspect of the subject that it deals with is of equal importance with the psychological. The author is seemingly far from being convinced that all mental disease is psychogenic, and his handbook of clinical laboratory methods is likely to prove very useful to the student entering on an asylum course, for no preconceptions as to the psychogenesis of mental disorder can render nugatory the importance of painstaking examination of the physical side of the diseased organism. The latter, indeed, is in many cases calculated to throw light on the origin and type of the mental symptoms. Dr. Barbé's little compendium deserves a cordial welcome among asylum men.

TEXT-BOOK OF NEUROLOGY.

Lehrbuch der Nervenkrankheiten für Studierende und Praktische Ärzte. In 30 Vorlesungen. Second enlarged and completely revised edition. By ROBERT BING, Professor in the University of Basle. Berlin and Vienna: Urban and Schwarzenberg. With 162 illustrations, some in colours. 1921. Pp. 672.

THE first edition of Prof. Robert Bing's text-book of neurology was reviewed in these columns in March, 1914, and there is little wonder that, with the great increase in the study of the nervous system which the intervening years have seen, the chapters on the peripheral nerves, neurosyphilis, acute infective diseases of the nervous system, cerebral and cerebellar disease, dysglandular syndromes, and the psychoneuroses, have been almost entirely re-written. The book presents itself for consideration as an up-to-date product of the active and progressive school of neurology in Switzerland and deserves all the favourable commendation we can give it, nor does it need its author's apology for his inability during the years of the war to keep himself abreast of the neurological literature of foreign countries; after all, originality derived from the utilisation of personal material is as valuable as, or more than, a mere compendium of the ideas of other workers. Notwithstanding the disadvantage we felt, and feel, the author labours under in adopting the "lecture" form of presentation of his subject, we acknowledge the successful way in which he manages to cover the field, no small one at that, of modern neurology, though omissions of one sort or another will strike the reader. In the chapter on the dyskinesias, included in which is paralysis agitans, the pathological information supplied is very meagre; and in a volume of this size the few lines given to myotonia atrophica seem unsatisfying when pages are devoted to sclerodermia. Under tumours of the temporal lobe, reference is made in one line to the occurrence of hallucinations of taste and smell, but the significant addition of a peculiar "dreamy state" in many of these cases is not mentioned. It is easy, of course, to criticise sins of omission; the book is intended rather for practitioners than for neurologists by profession, and we can congratulate Prof. Bing on having worthily attained his aim.

THE SYMPATHETIC AND ASSOCIATED SYSTEM.

Le Sympathique et les Systèmes Associés. Second edition, revised and enlarged. By A. C. GUILLAUME. With Preface by Prof. PIERRE MARIE. Paris: Masson et Cie. 1921. Pp. 396. Fr.18.

ON its first appearance we gave this monograph a favourable review, commending it for its clarity and comprehensiveness and for its useful diagrams. The first edition was a slender brochure of some 160 pages; the second runs to nearly 400, and therefore contains a vast amount of new material, revolving mainly round the question of the clinical physiopathology of the sympathetic system. In its present form it will be found particularly useful to the clinician, to whose attention we again heartily recommend it. The new diagrams are conspicuously serviceable, though the errors we noted in Figs. 5 and 11 have not been corrected. The book is sorely in need of an index.

A TEXT-BOOK OF PATHOLOGY.

Seventh edition. By ALFRED STENGEL, M.D., Sc.D., Professor of Medicine, University of Pennsylvania, and HERBERT FOX, M.D., Director of the Pepper Laboratory of Clinical Medicine, University of Pennsylvania. London and Philadelphia: W. B. Saunders Company. 1921. With 509 text illustrations and 15 plates. Pp. 1111. 42*s*.

WHEN this text-book first appeared in 1899 it was intended to make appeal to the "clinical pathologist" as the term was then used in America. As such, rather than as an exhaustive treatise on pathology, we then gave it favourable notice. Pathology has during the last two decades shaken itself free of many shackles, and the authors seem hardly to have kept in touch with its developments. Their present outlook on the science may be illustrated by their statement (p. 146) that inflammation "is a pathological state *per se*, but considered from the point of view of its result . . . . inflammation is essentially conservative and useful." The first seven words contain about as many misconceptions of the subject with which they are dealing as it would be possible to express so briefly. To conceive of inflammation as a state instead of a process, and by "but" to imply that pathological processes are not as a rule useful, is to go about as far astray on fundamental considerations as anyone can. It is the attitude which likes to look on the subject matter of pathology as a series of states which can be classified and labelled and put in compartments already marked out for them like a collection of postage stamps, and misses altogether the truth that the student of pathology has to do with the passing phases of a pageant of reaction and adaptation as inspiring as any that he has had a chance to get a sight of. If only the authors could have seen Burdon-Sanderson twenty-five years ago leaning up against the blackboard with his eyes shut and muttering to himself, "Yes, yes, a process, not a state"—still they have had plenty of opportunity of reading Adami. Pathology on the authors' terms is such a hopelessly dull subject—perhaps this is why they both profess medicine.

The first part, extending to 427 pages, deals with general pathology, including bacteriology, and is unsatisfactory. From the section on acidosis (p. 44) no one would gather that respiration had anything to do with the regulation of the acid-base equilibrium in the body; there is a general reluctance to make definite statements which leads the authors to surmise (p. 30) that "the low partial pressure of oxygen at high altitudes has in all probability something to do with" mountain sickness; in œdema (p. 79) "a second process at work is that known as diffusion or osmosis." It may be, of course, that the authors, by the curious convention that has prevailed and which cheap copies of Cohnheim and Lazarus-Barlow have failed to dissipate entirely, regard these functional topics as not being part of pathology properly so called and that they have dealt with them just to fill up their schedule. But sections which have been pathological for all time are equally bad. Under tumours there is no kind of attempt to discover what tumours really are, and the only recognition of the quite fundamental information which has been obtained from the experimental investigation of mouse cancers is a reference to Miss Slye's breeding experiments and (p. 168) "various investigators since Hanau have found it possible to transplant certain tumours from man to animals or from one animal to another," which could not be more misleading even if it were capable of a jesuitical defence as not being untrue. The preface is dated April, 1921, and we read that "the cultivation of the gonococcus is difficult" (p. 293), "the typhoid bacillus is peculiarly resistant and may thrive upon clothing, in soil and in water for a long time" (p. 305),—"difficult," "peculiarly," and "long" are truly relative terms—and (p. 400) that the life-history of Bilharzia after the eggs leave the body is unknown. "Dyspnœa" and "rodent ulcer" do not occur in the index, and the only reference to scurvy is (p. 368) "several micro-organisms have been described," though beri-beri and pellagra have a page apiece.

The second part, special pathology, occupies the remaining 632 effective pages. It is mostly arranged under organs, with subsections, "congenital abnormalities," "circulatory disturbances," "atrophy and degenerations," "inflammations," "infectious diseases," and "tumours," and these categories are adhered to with a remarkable determination to say something under each heading whether it be of interest or importance or not. The authors' orderly scheme requires that active and passive hyperæmia should always form subheadings of "circulatory disturbances," and they tell the student that the former is associated with the early stages of inflammation and the latter with general circulatory failure over and over again under each organ separately; what is true of the pharynx, œsophagus, and kidney is probably true of the stomach, intestines, and pancreas; in all about a page is wasted by repeating for each of these six organs what a tolerable acquaintance with general pathology should make it unnecessary to state for any of them. The whole forms a dull and uninspiring catalogue of reasonably accurate information.

The book propagates the idea that pathology deals with a series of isolated anatomical facts with no general principles behind them and without any very important functional effects. The pity of the situation is that since 1898 it has gone through seven editions and has been reprinted in all on 18 occasions without keeping in touch with the science of pathology. The get-up of the present edition is excellent, the illustrations variable, some very good with a few quaint relics—e.g., the picture of acute urethritis (Fig. 398); a fair number are clinical without pathological interest.

MOTHER AND CHILD.

Fourth edition. By EDWARD P. DAVIS, A.M., M.D. London: J. B. Lippincott Company. 1921. Pp. 278. 12*s*. 6*d*.

THIS book, the first edition of which was brought out in 1902, is intended rather for the domestic hearth than for the medical profession. It contains nothing novel, but has been brought up to date, incorporating the more recent teaching on ante-natal care and on infant feeding. The book is in two parts, dealing respectively with mother and with child. The division of the chapters into short sections, each with its own heading, may facilitate the use of the book as a work of reference, but spoils the sequence of thought. The simple directions cover all essential points, and should result in the more intelligent observance on the part of the mother and nurse of the precautions advised by the doctor. A word may be added in praise of the illustrations, of which there are 33, more than half dealing with various details of the infant's wardrobe; these drawings add materially to the value of the book.

LE DARWINISME ET NOTRE SANTÉ.

By EDOUARD JUNG. Sainte-Marie-aux-Mines (Haute Rhin): E. and R. Cellarius. 1921. Pp. 120. Fr.5.

THIS small book is an attempt to put forward, according to the doctrines of evolution, a rational explanation of the principles underlying Nature's methods of preventing disease. It amounts to a plea for the "simple life," based upon arguments which are intended to appeal rather to the man of science than to the man in the street. After dealing with the general principles of the theory of evolution, and defining and explaining the terms in use, Mr. Jung proceeds to enunciate and consider seven laws. These lay down the relationship existing in nature between hereditary and acquired characters, and urge that some at any rate of the latter are harmful to the individual and therefore to the race. The seventh law propounds that "every (acquired) habit contrary to specific adaptations is injurious"; everything

that the individual has acquired, if such as to interfere with his inherited characters, is bound to react detrimentally upon his health or powers of resistance to disease. This seems to be pushing the matter too far, for some inherited characters would bear modification. The book goes on to discuss certain of Nature's prophylactics against disease, which maintain good health and so favour in the struggle for existence the individual who adopts them. Such are exercise, proper food, fresh air and sunshine, adequate sleep, and the use of water. None of this is new, but though preached for ages only the lucky few are able to make full use of the preventive and remedial measures which Nature provides. For centuries man has at certain times cast aside the bonds of civilisation, and has gone away to enjoy the holiday that brings him in closer touch with Nature, knowing instinctively that is the sort of holiday most likely to bring him back to normal health.

The moral of the book is that the means employed by Nature to produce a healthy race should also be those resorted to by the individual to remain healthy, or to recover health when it is temporarily lost.

JOURNALS.

British Journal of Children's Diseases. Vol. XVIII. July–September. Edited by J. D. ROLLESTON, M.D.—Dr. Bernard Myers contributes a paper on a Case of Oxycephaly in a girl aged 12 with tracings of the skull and skiagrams. The patient belonged to the group of oxycephaly cases described by H. Morley Fletcher in which changes occur in the first few months of life in the shape of the head, prominence of the eyes being observed at the same time. In such cases the condition becomes more evident during the first two years and is accompanied by increasing impairment of vision. The paper contains an account of the ophthalmoscopic examination of the case made by Dr. Bickerton and of the X ray findings by Dr. Martin Berry.—In a paper on Rickets, with Special Reference to its Ætiology, Early Manifestations, and Treatment, Dr. James Burnet, of Edinburgh, emphasises the fact that "rickets is essentially, in the first instance at all events, a disease of alimentation," and protests against its being regarded as a disease of bones. He is firmly convinced that rickets could be practically stamped out if the sale of "infant foods," dried milk, and condensed milk were strictly regulated, and medical men were warned against these articles as a routine method of infant feeding. Other causes of rickets, such as bad hygiene, he regards as insignificant compared with improper feeding. The early manifestations of rickets are divided by Dr. Burnet into catarrhal phenomena, nervous phenomena, and vaso-motor phenomena. Catarrhal phenomena, which are probably the earliest manifestations of all, consist in gastro-intestinal symptoms, such as vomiting and diarrhœa and a marked tendency to nasal, aural, and bronchial catarrh. The nervous phenomena include restlessness and irritability, attacks of crying, disturbed sleep, and convulsions. The principal vaso-motor phenomena are profuse sweating and the appearance of a red line when the finger-nail is lightly drawn across the skin. In the treatment of the disease Dr. Burnet attaches special importance to prophylaxis. If breast milk is not available he considers that scalded cows' milk, pure or diluted with water, or citrated, is the only proper substitute. As an adjunct, cod-liver oil may be ordered either pure or in the form of a good emulsion. Fresh air and sunlight and massage with olive oil are useful additional measures.—Dr. W. McKim Marriott, of St. Louis, writes on Abnormal Metabolism in Infancy and its Relationship to Symptomatology.—Mr. W. M. Mollison reports two cases of Paralysis of Eye Muscles Occurring in Connexion with Mastoiditis: Recovery. In the first case the paralysis came on after operation for acute symptoms arising in the course of chronic suppuration, and in the second in the course of simple acute mastoiditis. In neither case was any extension of disease found towards the tip of the petrous bone. Both cases had certain features in common—namely, pain about the affected eye, nausea and vomiting, slow pulse combined with paralysis of the levator palpebræ superioris, but in the first case paralysis of the third cranial nerve and in the second of the sixth cranial nerve was present. Some form of meningitis was probably responsible for involvement of individual cranial nerves, though the evidence was very poor in the second case.—The Society Intelligence contains résumés of cases of pædiatric interest shown at various sections of the Royal Society of Medicine and an account of recent meetings of the Philadelphia Pediatric Society and Société de Pédiatrie of Paris.—The abstracts from current literature are devoted to tuberculosis and dermatology.

The Journal of Biological Chemistry (Vol. XLVI., 1921) contains the following papers of interest on various problems of nutrition:—

Studies in the Digestibility of Proteins in Vitro. (1) The Effect of Cooking on the Digestibility of Phaseolin, by H. C. Waterman and C. O. Johns.—Preliminary work on a method for the comparison of protein digestibilities is described, and the possibility of developing an approximately quantitative method is discussed. The experiments indicate that phaseolin (navy bean) is rendered more readily digestible by boiling with distilled water. Cooking for five minutes gave a detectable increase in digestibility, while cooking for three-quarters of an hour apparently produces the maximum effect.

The Available Carbohydrate in Thrice-boiled Vegetables, by L. O'Reilly and E. H. McCabe.—With the introduction of thrice-boiled vegetables into the dietary of diabetics it becomes of importance to know the carbohydrate content available to the organism. From their investigations the authors conclude that only in the case of a few thrice-boiled vegetables is it possible to free them completely from carbohydrate as determined by taka-diastase. The use of 20 parts of water as compared with 10 for each boiling makes the extraction more complete, and by this method vegetable marrow, lettuce, and celery can be completely freed from available carbohydrate, and canned spinach, canned asparagus, turnips, beets and onions rendered approximately carbohydrate free. Canned string beans, cauliflowers, pumpkins, cabbage and carrots still retain about 0·5 per cent. available carbohydrate. The addition of sodium bicarbonate 0·05 to 0·1 per cent. assists complete extraction.

Antiscorbutic Potency of Milk Powders, by E. B. Hart, H. Steenbock, and N. R. Ellis.—Milk powders vary in their antiscorbutic properties. Apart from the factor of the initial vitamin content of the milk as influenced by feed, the powders vary in their potency with the process used in their manufacture, the spray process being more destructive of antiscorbutic vitamin than the Just process. These results should in no way condemn the milk powders made by the spray process; they only point out their limitations when used as the sole source of nutrients in infant feeding.

Some Observations on the Stability of the Antiscorbutic Vitamin and its Behaviour to Various Treatments, by N. R. Ellis, H. Steenbock, and E. B. Hart.—Desiccation of cabbage in an atmosphere of carbon dioxide for 35 hours at 65° C. did not prevent the destruction of the antiscorbutic vitamin. Fermentation processes involved in the making of sauerkraut from cabbage and silage from corn result in the destruction of the antiscorbutic factor. This vitamin was not removed from the orange-juice by ether or by aeration, but whereas oxidising agents caused its destruction, mild reducing action was without effect. Blood charcoal and the Chamberland filter removed a measurable amount of this vitamin from orange-juice.

A Study of the Chlorine Content of Milk and Blood after the Ingestion of Sodium Chloride, by W. Denis and W. R. Sisson.—By the administration to lactating goats of a sufficiently large amount of sodium chloride to produce an 18 per cent. increase in the blood plasma content, the chlorine content of the milk is also raised. Coincident with this increase, there is a great diminution in the volume of milk.

The Determination of Carbohydrates in Vegetable Food, by V. C. Myers and H. M. Croll.—A relatively simple colorimetric method is described for the determination of the amount and form of the available carbohydrate in vegetable foods.

Other articles dealing with more general bio-chemical subjects may be briefly summarised thus:—

Contributions to the Biochemistry of Iodine. IV. The Effect of Thyroxin on Growth in White Rats and in Rabbits, by A. T. Cameron and J. Carmichael.—Using decrease of growth rate in growing rats, hypertrophy of heart, liver, kidneys, and adrenals, and decrease of growth rate of thyroid, as tests, thyroxin, when administered by mouth, produces the same qualitative effects as does desiccated thyroid. Quantitatively, when compared on a basis of iodine content, the effects of thyroxin are distinctly less. This is probably due to bacterial decomposition; thyroid acts as a shield. The hypertrophy of heart and lymphatic tissue resembles that observed in cases of hyperthyroidism.

The Chemical Nature of Tissue Coagulins, by C. A. Mills.—The active agent of tissue extracts is a protein-phospho-lipin compound, and the phospholipin alone, although possessing a slight effect on blood coagulation, accounts only for a small fraction of the total activity of the extract. Splitting of the compound destroys its activity, but reunion restores its action. The isoelectric point of the compound lies between $N \times 10^{-5}$ and $N \times 10^{-6}$ acidity. At this point the material precipitates from its solutions without loss of its activity on coagulation. The

purified substance possesses the solubility characteristics of the globulin class of proteins, and consists of about 41·6 per cent. phospholipin and 58·4 per cent. of protein, the latter contains about 1·06 per cent. of phosphorus in firm combination. Addition of further amounts of phospholipin to the active material increases its activity. The presence in the tissues of an actual union between the protein and phospholipin elements is shown, and also that any alteration in this relation causes changes in the specific activity of the compound.

The Action of Tissue Extracts in the Coagulation of Blood, by C. A. Mills.—Tissue extracts accelerate the clotting of blood in a very definite manner. The active tissue substance will not react with the blood fibrinogen to form fibrin, either in vitro or in vivo, except in the presence of soluble calcium salts. Injected intravenously, rapidly, and in sufficient amounts, tissue extracts, or the purified active substance, cause intravascular clotting and death in a very definite manner. Injected slowly and in smaller amounts the blood is rendered non-coagulable, partially or completely, the non-coagulability apparently depending on a gradual removal of the greater part of the fibrinogen from the blood stream. A marked decrease in the alkali reserve of the plasma develops along with the development of the negative phase of coagulation, but is apparently not the cause of it. The injection of active tissue extracts into the blood stream so as to produce non-coagulability without clot formation is followed by an excretion of the active tissue substance apparently unchanged in the urine (dogs and rabbits). As observed by Loeb, there is present a class specificity in regard to the action of the tissue extracts on blood clotting. The specificity, however, is not absolute, since mammalian lung extract will accelerate the clotting of frog blood.

Certain Chemical Changes in the Blood after Pyloric Obstruction, by A. B. Hastings, C. D. Murray, and H. A. Murray.—The following changes in the blood were found to occur after closure of the pylorus in dogs—a marked increase in the CO_2 combining power of the blood and a striking fall in the concentration of Cl ions. These changes are confirmatory of the work of McCann and of McCullum. The authors further show a slight increase in the concentration of calcium in the serum, a marked increase in the sulphur and phosphorus concentration, and a variable diminution in the sodium concentration. The pH of the plasma, after operation, showed only an insignificant rise; at death it fell rapidly.

The Effect of Age on Pancreatic Enzymes, by F. Fenger and M. Hall.—Powdered pancreas preparations stored under ordinary conditions for one year show a material diminution in their diastatic and lipolytic activities, certain samples becoming almost inert. The proteolytic activity of the same samples, however, remains constant, indicating that trypsin is the most stable of the pancreatic enzymes.

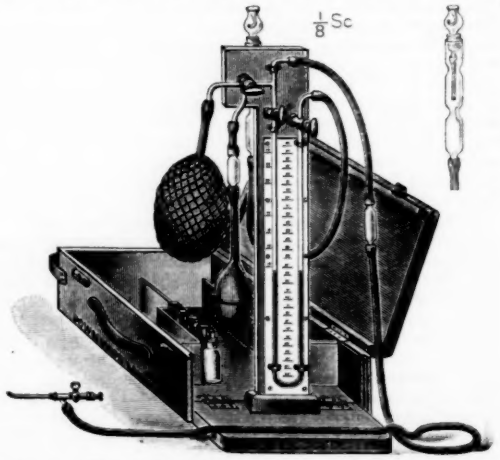
The *Journal of the Royal Army Medical Corps* for September opens with a Preliminary Report on a Substitute for the Wassermann Reaction by Bt. Lieut.-Col. H. Marrian Perry and Major E. C. Lambkin. The "substitute" is the flocculation method of Dreyer and Ward,[1] or the Sigma test, which these officers tested against the Wassermann reaction in 229 cases, in which they found the Sigma test rather more delicate. They also compared the two tests in the examination of 22 cerebro-spinal fluids, where again this test proved the more delicate.—Dr. C. M. Wenyon, late Temp. Col., A.M.S., gives an account of malaria in Salonika and in the Farther East in 1919, in continuation of his preceding paper. Caucasia is a country highly malarious, as bad as Macedonia, but troops were not compelled to occupy so many of the worst positions, consequently fewer cases occurred; still, in one party of 305 men, 303 were attacked in about a month, they having no mosquito nets and no prophylactic quinine. In no case in Macedonia was there so high an incidence in so short a time, which is thought to show that prophylactic quinine does confer some benefit. Attempts were being made in the Caucasus before the war to deal with malaria, and some remarkable posters were exhibited at Tiflis. Mosquitoes survive the winter as larvæ in sheltered pools or more usually as mature females by hibernating—culex in caves, anopheles in huts or stables. The anopheles prefer stables which are warmer (buffaloes are "veritable stoves"); during the winter they occasionally wake up and make a meal of blood; on fine bright days they even come out in the sun and bite. The impregnated females in autumn become fat and as the weather cools collect in the barns; their ovaries develop slowly through the winter, and fully developed ovaries were found in March. Mosquito nets should be used from April to November inclusive. Malaria was more intense in the valleys because the anopheles in the valleys were chiefly the earlier breeding, and so earlier infected, *A. maculipennis* (May to November), but in the hills chiefly *A. superpictus* with a shorter season of infection (July to October). Of each variety about 6 per cent. were infected. It is possible that an infected female may carry malaria on through the winter, but generally it is the natives who are the carriers and who infect the early broods.

[1] THE LANCET, 1921, i., 956.

New Inventions.

ARTIFICIAL PNEUMOTHORAX APPARATUS.

THIS apparatus is a modification of that of Prof. Morelli, of Pavia, and its advantages are ease of manipulation and portability. The water-manometer is connected on the one hand with a collapsible india-rubber bag or reservoir of 400 c.cm. capacity and with a flexible tube leading to a hollow needle on the other hand. To the distal limb of the manometer is connected a safety-trap which prevents spilling of fluid. Air, nitrogen, or oxygen is run into the reservoir through the three-way tap on the left-hand side of the apparatus, the reservoir being almost filled but on no account distended. To this three-way tap is attached a glass bulb, containing sterilised cotton-wool, which acts as a filter for the gas, a similar filter being connected with the flexible tube leading to the needle. Gas having been run into the reservoir, the three-way tap is now turned so that all its openings are sealed, and the manometer taps are opened. After the usual aseptic precautions, the hollow needle is now thrust through the chest wall until the mano-



meter reading indicates that the pleural cavity has been reached. The left-hand manometer tap is now closed and the three-way tap turned so that the coloured bead is uppermost. Gas will be drawn into the pleural cavity from the bag. From time to time the three-way tap is closed and the manometer tap opened in order to register the changes in intra-pleural pressure. As this pressure rises, gas will cease to flow into the chest, and the bag must be gently squeezed by the hand to continue the injection. When the reservoir is empty, the three-way tap is turned so that the coloured bead is to the left, and more gas is run in until the bag is just not distended as in the first instance. For primary inductions I use the Riviere cannula, but for refills a sharp-pointed Parry-Morgan needle is more convenient. The case contains four glass-stoppered bottles in safety clips. These may be filled with ether and tinct. iodi for sterilising the skin, novocaine solution for anæsthetising the tissues, and collodion for sealing the puncture wound. I have used this apparatus extensively during the past 12 months and have found it in every way satisfactory. It was made for me by Messrs. Down Bros.

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Supplement to the Students' Guide.

DENTAL SURGERY.

ANYONE who is on the Medical Register is entitled to practise as a dentist, although he cannot register as such without a licence in dentistry; but it is of eminent advantage to take the L.D.S., otherwise few dental appointments at general or special hospitals or dispensaries are available.

THE DENTISTS' REGISTER.

The Registration of Dental Students is carried on at the Medical Council Office in London in the same manner as the existing registration of medical students, and subject to the same regulations as regards Preliminary Examinations. Candidates for a diploma in Dental Surgery must produce certificates of having been engaged during four years in professional studies, including two years' instruction in mechanical dentistry. The two years of instruction in mechanical dentistry, or any part of them, may be taken by the dental student either before or after his registration as a student. When a student can show evidence of regular pupilage in mechanical dentistry to a registered practitioner prior to the passing of a preliminary examination he may be allowed to antedate for a period not exceeding one year prior to the passing of a preliminary examination.

It is necessary for anyone practising Dental Surgery in this country to be on the Register, and no foreign qualifications are recognised, except the Dental Diploma granted in Belgium after examination by the Provincial Medical Commission, provided the holder has obtained the grade of "Candidate in Medicine" at one of the four Belgian Universities. Persons with Colonial and Foreign qualifications which have been obtained after a four years' curriculum can apply for special registration. Certain dental qualifications granted in Australia and New Zealand are also registrable. The Royal Colleges of the United Kingdom and ten of the Universities grant degrees or licences in Dental Surgery.

THE DIPLOMA-GRANTING BODIES IN DENTISTRY.

The Royal College of Surgeons of England grants a diploma in Dental Surgery under the following regulations, which apply to all candidates who have registered as dental students after Jan. 1st, 1897. Candidates are required to pass three examinations: the Preliminary Science Examination, the First Professional Examination, and the Second Professional Examination. 1. Preliminary Science Examination.—This is identical with Part I. of the First Examination of the Examining Board in England. Candidates who commenced professional study on or after Oct. 1st, 1913, must pass the Preliminary Science Examination before commencing the courses required for the Second Professional Examination. 2. The First Professional Examination.—The candidate must produce evidence of instruction in Dental Metallurgy and Practical Dental Mechanics. The Examination consists of Part I. (Mechanical Dentistry), Part II. (Dental Metallurgy), the examination in Dental Metallurgy being by written paper, and Part III. (*a*) General Anatomy and Physiology, (*b*) Dental Anatomy and Physiology conducted by papers and vivâ voce examination. The parts may be taken together or separately. III. The Second Professional Examination.—This is divided into two parts: (*a*) the General, (*b*) the Dental. The General part must be passed before the Dental portion. The instruction is obtained partly at a General Hospital and partly at a Dental Hospital.—The Second Professional Examination consists of: Part I., General Surgery and Pathology; Part II., Dental Surgery and Pathology, and Practical Dental Surgery. There is a written and vivâ voce examination in each part and a practical examination as well in Part II. Exemption from the Preliminary Science Examination is granted to candidates who have passed an Examination in Chemistry and Physics for a degree in Medicine at a University in the United Kingdom, in India, or in a British colony. Exemption from Examination in Anatomy and Physiology is granted to candidates who have passed the Second Examination of the Examining Board in England or the corresponding Examination for any degree or qualification in Medicine or Surgery registrable under the Medical Act of 1886. Exemption from Examination in General Surgery and Pathology is granted to candidates who have passed the Examination in Surgery of the Examining Board in England or the corresponding Examinations of the Colleges and University above mentioned. The fee for the diploma is 20 guineas, and is payable as follows: Preliminary Science Examination, for each admission to Part I., £3 3*s.*; Part II., £2 2*s.* First Professional Examination, for each admission to Part I., £4 4*s.*; Part II., £1 1*s.*; Part III. (*a*) £2 2*s.*; (*b*) £2 2*s.*; Second Professional Examination, for each admission to Part I., £2 2*s.*; Part II., £4 4*s.* Synopses of examinations and all further information can be obtained from the Secretary, Examination Hall, Queen-square, London, W.C. 1.

Royal College of Surgeons, Edinburgh.—Regulations giving a list of Preliminary Examinations recognised for obtaining the Licence in Dental Surgery, as well as of the subjects of the Professional Examinations, may be obtained from Mr. D. L. Eadie, Clerk to the Royal College of Surgeons, at 49, Lauriston-place, Edinburgh. Candidates must produce certificates of having, subsequently to the date of registration, been engaged for four years in professional studies and of three years' instruction in Mechanical Dentistry from a registered dental practitioner, except in the case of previously registered medical practitioners, when two years will be considered sufficient. Candidates must also have attended a course of instruction at a University or in an established school of medicine or in a provincial school specially recognised by the College as qualifying for the Diploma in Surgery. In addition they will be required to have attended in a recognised dental hospital, or with teachers recognised by the College, special courses of lectures and instruction in Anatomy and Physiology (Human and Comparative), Surgery, Pathology, Materia Medica, Dental Histology, and Practical Dental Mechanics and Metallurgy; two years' attendance at a dental hospital or the dental department of a general hospital recognised by the College. Practical instruction in Mechanical Dentistry from a registered Dentist, or in the Mechanical Department of a recognised Dental Hospital and School, for *three* years. Candidates who have passed the First and Second Examinations for the Triple Qualification will be exempt from the First Dental Examination, and will have the advantage of being admissible either to the Final Dental Examination or to the subsequent Examination for the Triple Qualification, or to both. But the First Dental Examination will not be held as equivalent to the First and Second Triple Examinations, and will admit to the Final Dental Examination only. Candidates who are Licentiates of this College or who may be registered medical practitioners will be required to produce certificates of attendance on the special subjects only and will be examined in these only for the dental diploma. First Professional Examination: The candidate must have attended the required courses. The examination embraces (1) Chemistry and Physics; and (2) Anatomy and Physiology. The fee is £5 5*s.* for the complete examination, and £3 3*s.* is payable for each division. In all cases of rejected candidates the fee for re-entry is £3 3*s.* Second Examination: The candidate must have attended the remaining courses of the curriculum, must produce certificates showing that he is 21 years of age, and must pay a fee of £10 10*s.*, for re-entry £5 5*s.* The examination embraces (1) Surgery and Medicine; and (2) the special subjects of Dental Anatomy and Physiology, Dental

Surgery and Pathology, Dental Materia Medica, Dental Mechanics and Dental Metallurgy, with a practical as well as the written and oral examinations in the subjects of Dental and Oral Surgery, Pathology, and Mechanics. The candidate will be tested in the Treatment of Dental Diseases, in Operative Dentistry, the Administration of Anæsthetics, Orthodontics, and in Prosthetic and Mechanical Dentistry. Candidates who claim exemption from the First Dental Examination on the ground of having passed the First and Second Triple Qualification Examinations or other recognised examinations will, before being admitted to the Second Dental Examination, be required to pay the total fee of £15 15s. payable for the dental diploma. Fees and schedules must be lodged with the Clerk not later than one week before the examination.

Higher Dental Diploma.—The College grants a Higher Dental Diploma which is registrable in the Dentists Register as an additional qualification. Every candidate for the Higher Dental Diploma shall produce evidence that he has been engaged in the study or practice of his profession as a Registered Dentist for at least one year subsequent to his having obtained the Licence in Dental Surgery of the College, or a Licence or Qualification in Dental Surgery specially recognised by the College. Particulars as to the examinations can be obtained from Mr. D. L. Eadie, Clerk to the Royal College of Surgeons, 49, Lauriston-place, Edinburgh. The fee payable by Licentiates of the College is £15 15s. For all other candidates £21. A fee of £10 10s. is retained for examination expenses in the case of referred candidates.

The examination embraces the following branches of Dental Science and practice: Dental Surgery, Anatomy, Pathology and Bacteriology, Prosthesis, Anæsthesia, and Dental Radiology. The examination will be clinical and practical as well as written and oral. Candidates will be expected to show a high degree of knowledge and skill.

Royal Faculty of Physicians and Surgeons of Glasgow.—The regulations as to certificates, curriculum, number, and subjects of examinations, fees, &c., are in effect similar to those of the Royal College of Surgeons of Edinburgh, but embrace Dental Bacteriology. Candidates can enter for the First Examination in three divisions, the first embracing Physics and Chemistry, the second Dental Metallurgy and Dental Mechanics, and the third Anatomy and Physiology. The examination in Dental Mechanics is practical: and there is at the Final Examination an examination in Practical Dentistry conducted in a dental hospital. Copies of regulations, &c., to be obtained from Mr. Walter Hurst, Registrar, Faculty Hall, 242, St. Vincent-street, Glasgow.

Royal College of Surgeons in Ireland.—Candidates for the Licence in Dental Surgery are required to pass two professional examinations. Before the First Examination the candidate must produce evidence of having attended courses in Theoretical and Practical Chemistry, including Metallurgy and Physics, at a recognised institution; of having been registered as a medical or dental student by the General Medical Council; and of having attended courses of instruction in the following subjects at a recognised school of medicine: (*a*) Anatomy Lectures; (*b*) Dissections with Demonstrations; (*c*) Physiology, including Dental Physiology; (*d*) Practical Physiology and Histology, including Dental Physiology and Histology, Human and Comparative. Before the Final Dental Examination the candidate must have been engaged during a period of two years in acquiring a practical familiarity with the details of Mechanical Dentistry under the instruction of a registered dentist, or under the direction of the superintendent of the Mechanical Department of a recognised Dental Hospital, and have attended, at institutions recognised by the College for the purpose, the following courses of instruction: (*a*) Dental Surgery and Pathology, Orthodontia, and the Materia Medica and Therapeutics applicable to Dental Surgery. Lectures. Two courses. (*b*) Dental Mechanics. Lectures. Two courses. (*c*) Dental Anatomy. Lectures. One course. (*d*) The practice of a Dental Hospital, or of the Dental Department of a General Hospital. Two years. He must also have attended Clinical instructions at a recognised General Hospital during the ordinary teaching sessions (nine months), and have been engaged during four years in the acquirement of professional knowledge subsequently to the date of registration as a medical or dental student. One year's bona-fide apprenticeship with a registered dental practitioner, after being registered as a medical or dental student, may be counted as one of the four years of professional study. He must be 21 years of age.

In the First Dental Examination candidates will be examined in (A) Physics and Chemistry, including Practical Chemistry and Metallurgy. (B) Anatomy, Physiology, and Histology—General and Dental. All the subjects may be passed at the same time, or they may be passed in two groups, (A and B). The examination is partly written, partly vivâ voce, and partly practical.

In the Final Dental Examination candidates will be examined in General Pathology, Medicine, and Surgery; Dental Surgery, and Dental Pathology, with the Materia Medica and Therapeutics applicable to Dental Surgery; Dental Mechanics and Metallurgy; Orthodontia. Candidates must pass in all the subjects at one examination. The examination is partly written, partly vivâ voce, and partly practical, and includes the examination of patients and the performance of dental operations. Candidates are required to provide their own instruments and gold for filling. The First Dental Examination will commence on the first Mondays in the months of February, May, and November. The Final Dental Examination will commence on the second Mondays in the months of February, May, and November. The total fee for the Diploma in Dental Surgery is 20 guineas. Candidates must pay the fees for examinations from which they are exempted, unless when such exemptions have been granted in virtue of examinations passed before the Conjoint Board in Ireland.

University of Birmingham.—The teaching of Dentistry is undertaken by the University acting in association with the Birmingham Dental Hospital and the Birmingham Clinical Board. The instruction at the Dental Hospital is carried out under the direction of the University Dental Clinical Board, so that students may fully qualify themselves for the Dental Diploma (L.D.S.) of this and other universities and licensing bodies. There is a special and well-equipped Dental Museum and Laboratory. An Entrance Exhibition, value £37 10s., is awarded annually at the commencement of the winter session. The following are the regulations for Degrees in Dentistry:—1. The degrees conferred by the University are those of Bachelor and Master of Dental Surgery (B.D.S. and M.D.S.). 2. All candidates for these degrees must pass the same Matriculation Examination as that required from candidates for Medical Degrees. 3. The degree of Bachelor of Dental Surgery is not conferred upon any candidate who has not obtained a Licence in Dental Surgery. The candidate is not eligible for the degree until a period of 12 months has elapsed from the passing of his examination for the Licence in Dental Surgery. Of this period at least six months must be spent in the dental department of a general hospital approved by the University. 4. *A.* In addition to the Licence in Dental Surgery the candidate must produce evidence that he has attended the courses required by medical students of the University in the following subjects and passed the Examinations held in the same for Medical and Surgical Degrees: (*a*) Chemistry and Practical Chemistry (*b*) Physics and Practical Physics, (*c*) Elementary Biology, (*d*) Anatomy and Practical Anatomy, and (*e*) Physiology and Practical Physiology. *B.* That he has passed the class examinations in: (*f*) One Special Course of Lectures on Medicine, (*g*) One Special Course of Lectures on Surgery, and (*h*) Pathology and Bacteriology. *C.* That he has attended courses and

passed the class examinations in: (*k*) Dental Histology and Patho-Histology, (*l*) Comparative Dental Anatomy, and (*m*) Dental Surgery and Prosthetic Dentistry. *D*. That he has received instruction in the Clinical Examination of living cases at the dental department of a general hospital for a period of not less than six months. 5. The Final Examination will deal with the subjects in Classes *C* and *D*. 6. On the expiration of 12 months from the date of passing the Examination for the Degree of Bachelor of Dental Surgery, the candidate will be eligible for that of Master of Dental Surgery. 7. For this degree candidates will be required to submit a thesis containing original work and investigations in some subject connected with Dentistry, which theses shall be submitted to examiners to be nominated by the Dental Advisory Board.

University of Bristol.—Candidates for the degree of Bachelor of Dental Surgery must be not less than 21 years of age and shall have pursued the courses prescribed by University regulations during not less than five years, of which three shall have been passed in the University, and shall have been registered as dental students by the General Medical Council. All candidates for the degree of B.D.S. are required to satisfy the examiners in the several subjects of four examinations. The First Examination: The subjects are Chemistry, Physics, and Zoology, and the curriculum extends over one year.* The Third Examination: The subjects are Dental Mechanics, Dental Metallurgy, and Dental Materia Medica, and the candidate shall produce evidence of having served for three years an approved pupilage in Dental Mechanics. The Second Examination: The subjects are Anatomy, Physiology, and Histology, Dental Anatomy, and Dental Histology. The Final Examination: The subjects are Medicine and Surgery, Dental Surgery (including Prosthetics), Operative Dental Surgery, and Dental Bacteriology. Degree of Master of Dental Surgery: Candidates shall be Bachelors of the University, shall present a Dissertation on some subject of Dental Surgery to be approved by the Examiners, and pass an examination in Dental Surgery. Diploma in Dental Surgery: Candidates need not be undergraduates, but shall have passed an entrance examination satisfactory to the University before being admitted to any professional examination; the curriculum extends over four years. A three years' pupilage in Mechanical Dentistry is required and four examinations must be passed, the subjects of which differ only from those of the B.D.S. in that Zoology is not required for the First Examination, and Medicine is not required for the Final Examination. Candidates who are already registered medical practitioners shall be further exempted from study and examination in Physics and Chemistry, Anatomy, Physiology and Histology, Medicine, and General Surgery.

University of Durham.—Every candidate for the Licence in Dental Surgery must be registered as a dental student. There are four Examinations. The subjects are:—*First*: (*a*) Chemistry; and (*b*) Physics. *Second*: (*a*) Dental Mechanics, Theoretical and Practical; (*b*) Dental Metallurgy. *Third*: (*a*) Anatomy; (*b*) Physiology and Histology; (*c*) Dental Anatomy and Dental Histology; and (*d*) Dental Materia Medica. *Final*: (*a*) Surgery; (*b*) Dental Surgery, including Prosthetics and Orthodontia; (*c*) Operative Dental Surgery, Practical Examination; and (*d*) Dental Pathology and Bacteriology. A candidate before presenting himself for examination is required to furnish certificates of instruction in the following subjects, attended after registration as a dental student at recognised Colleges or Schools:—*First Examination*: Chemistry and Physics. *Second Examination*: Dental Mechanics and Dental Metallurgy. *Third Examination*: Anatomy, with Dissections; Physiology; Histology; Dental Anatomy and Physiology; Dental Histology; and Dental Materia Medica. *Final Examination*: Dental Hospital Practice (two years); General Hospital Practice (nine months); Medicine Lectures (two terms); Surgery Lectures (two terms); Dental Surgery and Pathology (a course of not less than 20 lectures); Dental Bacteriology (three terms); Operative Dental Surgery (not less than 12 lectures); and Anæsthetics (a course of not less than one month).

Before admission to the Final Examination each candidate must furnish evidence (1) of having attained the age of 21 years; (2) of having undergone a three years' pupilage in Mechanical Dentistry with a registered dentist; and (3) of having been engaged in professional study for at least four years subsequent to registration as a dental student. The examinations will be held concurrently with the medical examinations, and the fees payable by candidates are as follows: First Examination, £2 10*s*.; Second Examination, £2 10*s*.; Third Examination, £3 10*s*.; Final Examination, £3 10*s*.; fee for Licence, £3; total, £15. For re-examination: First Examination, £1 10*s*.; Second Examination, £2; Third Examination, £2 (in one part only, £1); Fourth Examination, £2. The practical examinations in dentistry will be conducted at the Newcastle Dental Hospital.

University of Leeds.—The degrees in Dental Surgery are Bachelor of Dental Surgery (B.Ch.D.) and Master of Dental Surgery (M.Ch.D.). All candidates for the degree of Bachelor of Dental Surgery shall be required to have passed the Matriculation Examination, to have pursued thereafter approved courses of study for not less than five academic years, two of such years at least having been passed in the University subsequently to the date of passing Parts I. and II. of the First Examination, and to have completed such period of pupilage or hospital attendance, or both, as may be prescribed by the regulations of the University. No candidate will be admitted to the degree who has not attained the age of 21 years on the day of graduation. The classes in the Department of Dentistry begin on Oct. 3rd. The instruction in the Preliminary subjects of Chemistry, Physics, and Biology are given at the University in College-road. The classes in the other subjects and the systematic courses in Dental subjects are held in the School of Medicine of the University in Thoresby-place. The clinical instruction is given in the Dental Department at the Leeds General Infirmary. Applications for the prospectus should be made to the Dean of the Faculty of Medicine.

University of Liverpool (*Liverpool Dental Hospital Clinical School and School of Dental Surgery*).—The University grants a Licence in Dental Surgery (L.D.S.) and degrees in Dental Surgery (B.D.S. and M.D.S.). The courses of systematic instruction are given in the University buildings, five minutes' walk from the Dental Hospital. The two institutions are closely associated, and the management of the curriculum is in the hands of the Board of Dental Studies. The Dental Hospital, covering a site of 672 square yards, is equipped in each department with every modern accessory and receives constant additions. The laboratory is in charge of a skilled dental mechanic under the supervision of the Director of Dental Education and Dental Staff, and students are able to undertake at the hospital the whole of their training in Mechanical Dentistry. The times of the lectures at the University are arranged to meet the convenience of students, thus allowing the maximum time for attendance upon Dental Hospital practice. Fees: The fees for the complete courses, including Pupilage and Hospital Practice, are as follows: Degree of B.D.S., £237 10*s*.; M.D.S., £18 5*s*.; L.D.S. (Liverp.), £199; L.D.S. (other licensing bodies), £203. Further information may be had from the Director of Dental Education, Prof. W. H. Gilmour.

University of Manchester.—In the University of Manchester the Dental Department forms an integral part of the Faculty of Medicine. This contains a series of laboratories, lecture rooms, and museums which will bear comparison with those of any other

* Candidates who have passed the Higher School Certificate approved by the Board of Education in these subjects will not be required to sit for the first examination for either the B.D.S. or the L.D.S., and will be regarded as having completed one year of study.

school in the kingdom, and the fullest opportunities for study are offered to students preparing for any of the professional examinations. Instruction adapted to the requirements of students preparing for the B.D.S. Degree and the Dental Diplomas of the University, the Royal College of Surgeons of England, and of other licensing bodies is given throughout the session both at the University and at the Dental Hospital of Manchester adjoining the University. The required general hospital practice is taken at the Manchester Royal Infirmary. Women students are admitted to the classes in the Dental Department, and for them common rooms are provided. The composition fee for candidates for the University degree of Bachelor of Dental Surgery is 93 guineas, payable in three equal yearly instalments. The composition fee for candidates for the University Diploma in Dentistry is 83 guineas, payable in three equal yearly instalments. The composition fee for candidates for the L.D.S. of England is 93 guineas, payable in three equal yearly instalments. Students who have already served their apprenticeship with a private practitioner, and who propose to complete the final portion of their attendance at the University and at an approved dental hospital, will be required to pay the composition fee in two equal instalments at the commencement of the first and second years of studentship. The composition fee does not include the hospital fees, the examination fees, nor the fee for the conferment of the degree or the diploma.

National University of Ireland.—This University grants the degrees of Bachelor of Dental Surgery and a degree of Master of Dental Surgery. A student may not be admitted to the Degree of Bachelor of Dental Surgery unless a period of not less than four years shall have elapsed from the date of his matriculation, during which period he must have pursued an approved course of study of not less than nine terms. For the degree of Bachelor of Dental Surgery candidates must pass four examinations, the first two being the same as those for the first and second examination in Medicine. The subjects of the third examination are Dental and Practical Pathology, Dental Surgery and Dental Medicine, the subjects of the fourth being Dental Surgery and Pathology, Dental Mechanics, Operative Dentistry, Orthodontia, and Dental Materia Medica. A candidate for the degree of B.D.S. must produce evidence of having been engaged during a period of two years in acquiring a practical familiarity with the details of Mechanical Dentistry under the instruction of a registered dentist, or under professional direction in the mechanical department of a dental hospital approved by the University. A portion of or the entire period may be served before commencing study for the degree of B.D.S., but no portion so taken prior to commencement of study shall count as part of the four years of Dental Study. The degree of Master of Dental Surgery will not be granted until three years after the B.D.S. has been obtained.

Queen's University of Belfast.—At the beginning of session 1920–21 a Department of Dentistry was opened, and in due course the University expects to confer a Licentiate in Dental Surgery, a Bachelor of Dental Surgery, and a Master of Dental Surgery. Lecturers have been appointed in Dental Surgery, Dental Mechanics, Dental Metallurgy and Materia Medica, and Orthodontia.

TEACHING INSTITUTIONS IN DENTISTRY.

See also under Universities of Birmingham, Leeds, Liverpool, and Manchester above.

LONDON.

Royal Dental Hospital of London, School of Dental Surgery, Leicester-square.—A school of the University of London, and women are now admitted as students and are eligible for all hospital appointments and school prizes. The school provides the special dental education required by the Royal College of Surgeons for the Licence in Dental Surgery. The general part of the curriculum may be taken at any general hospital. The hospital is open from 9 A.M. to 5 P.M., there being one staff for the morning and another for the afternoon of each day. Pupils are received for the training in dental mechanics recognised by the curriculum. The demonstrators at the commencement of each session give a course of lectures on Operative Dental Surgery. The five house surgeoncies are held for six months each and are open to all qualified students. The lecturers, in addition to their lectures, give special demonstrations on the Microscopy of Dental Anatomy and Dental Surgery. The lecturer on Dental Mechanics also gives practical demonstrations in the laboratory. There is an Entrance Scholarship in Chemistry and Physics of the value of £50. One Entrance Scholarship in Dental Mechanics and Metallurgy, value £25, open to pupils of the Hospital only. One Entrance Scholarship of £25 in Dental Mechanics, open to pupils of private practitioners. The Saunders Scholarship of £20 and Saunders Prize of £5 awarded to second year students. The Storer Bennett Research Scholarship for Scientific Research in any branch of Dental Surgery, value £50, is awarded triennially. The Alfred Woodhouse Scholarship of £35 and the Robert Woodhouse Prize of £10 for Practical Dental Surgery. Prizes and certificates are awarded by the lecturers for the best examinations in the subjects of their respective courses at the end of the summer and winter sessions. Fee for two years' hospital practice required by the curriculum, including lectures, £70 in one payment, or £73 10*s.* in two yearly instalments. The curriculum requires two years to be passed at a General Hospital; the fee for this is about £63. Both hospitals can be attended simultaneously. For the lectures in Chemistry and Physics for the Preliminary Science Examination £13 13*s.* The fee for the instruction in Dental Mechanics and the two years' hospital practice required by the curriculum is £200 if paid in one instalment, or 200 guineas if paid in three equal instalments. The fee for tuition in Dental Mechanics is £70 per annum; for one year's hospital practice £28. The Winter Session opens on Oct. 3rd.

University College Hospital Dental School, corner of Great Portland and Devonshire-streets, W.—This Hospital and School has recently been thoroughly reorganised, and is now fully equipped with all the most modern appliances. Students are entered as students of University College Hospital, and, as such, attend the classes of Chemistry, Physics, Anatomy, and Physiology in University College, which is a few minutes' walk from the Dental Department in Great Portland-street, hitherto known as the National Dental Hospital, the first Dental School to admit Women Students. Practical courses to comply with the R.C.S. curriculum are held. Clinical Lectures and Demonstrations are given, and each student on entering passes through a preliminary course under a demonstrator. Two Entrance Exhibitions, of the value of £40 and £20, are open for competition. Prizes are open for competition at the end of each course of lectures. Composition Fees: Comprising two years' Dental Mechanics, Chemistry, Physics, Anatomy, Physiology; two years' Hospital Practice, Medicine, Surgery, and Dental Lectures (four years): 1st year, £77; 2nd year, £56; 3rd year, £92; 4th year, £32. Total, £257. Medical Men: Two years' Mechanics, and Dental Practice and Lectures: 1st year, £102 6*s.*; 2nd year, £70. Total, £172 6*s.* For a six years' course of medical and dental education comprising the whole of the dental curriculum and the curriculum for the M.R.C.S., L.R.C.P. diplomas: 1st year, £113; 2nd year, £70; 3rd year, £73; 4th year, £60; 5th year, £73; 6th year, £49; total, £438, in six instalments payable in advance.

Guy's Hospital.—The work of the Dental Department begins daily at 9 A.M. both in the extraction rooms and in the conservation room. The Extraction Rooms: A new Dental Out-patient Department has been provided. There is ample accommodation for ordinary extractions and anæsthetic extractions, together with waiting- and retiring-rooms. Patients

are admitted between 8.45 and 9.30 A.M., and are seen by the dental surgeon for the day, the staff demonstrator, the dental house surgeon, and the dressers. The Conservation Room is open from 9 A.M. till 5 P.M. It has recently been entirely remodelled and greatly enlarged, giving a floor space of over 6000 square feet. It affords accommodation for about 100 dental chairs, with the necessary equipment of the most modern type, for the use of the Dressers, who, under the supervision of the Staff, perform the various operations of Dental Surgery. The members of the staff attend every morning and afternoon to give demonstrations and otherwise assist students in their work in the Conservation Room and Prosthetic Laboratory. The Probationers' Laboratory is supervised by two of the staff demonstrators, and instruction is given in operative dentistry on a "mannikin" to students during their first three months of clinical study. Students in Dental Prosthetics are received, and a graded, systematic, and full course of instruction, extending over two years, is carried out. Dental students have the opportunity of attending at this hospital the whole course of instruction required by the examining board for the L.D.S. Eng.—viz., two years' studentship in dental prosthetics, the special lectures and practice of the Dental Department, and the general lectures and practice of the Medical School. The fees for these two courses may be paid separately or together, or they may be combined with the fees required to be paid for the course for a medical diploma. Students who enter for a medical as well as a dental diploma are allowed to pursue their study of Dentistry during any period of their medical course most convenient to themselves without further charge. Four Scholarships in Dental Prosthetics of the value of £30 each are offered for competition annually, two in September and two in April, and prizes of the aggregate value of £40 are awarded for general proficiency and for skill in Operative Dentistry. The Newland-Pedley Gold Medal for Operative Dentistry is also awarded annually. A Dental Travelling Scholarship of the value of £100 is awarded every second year. Dental students are eligible for admission to the Residential College and enjoy the privileges of students in the Medical School. Application should be made to the Dean of the Medical School.

London Hospital.—This school is a part of the London Hospital and Medical College, and is fully equipped on the most modern lines and with the latest appliances. It provides a complete curriculum in all subjects for the L.D.S. Diploma, and is admirably adapted for the purpose of teaching. The Conservation Room is well lighted and ventilated and fitted with pump chairs of the latest pattern; the fountain spittoon at every chair has been specially designed and has attached to it a saliva ejector, hot and cold water, compressed air, gas and electric current, also a swing bracket to carry the students' cabinet. Electric sterilisers are supplied in each department and motor engines where required. The School possesses in addition to the Theatres, Laboratories and Museums in the College, a special Museum of Dental Anatomy and Surgery, Operative Dentistry, Prosthetic and Extraction Rooms, and Laboratories for Practical Dental Metallurgy and Dental Prosthesis. A systematic course of instruction in Dental Prosthesis is arranged for pupils. The up-to-date Laboratory contains every modern apparatus and is in charge of a skilled curator and his assistants. Connected with the Medical College and Dental School are a Library, Athenæum, Clubs' Union, Dining Hall with moderate tariff, Students' Hostel, and an Athletic Ground. For full particulars as to fees and course of study advised apply to the Dean, Prof. William Wright, who will be glad to make arrangements for anyone wishing to see the Dental School and Medical College.

London (Royal Free Hospital) School of Medicine for Women.—Full courses are arranged for women students for the study of dentistry, and in preparation for the Licence in Dental Surgery of the Royal College of Surgeons of England, at the London (Royal Free Hospital) School of Medicine for Women, in conjunction with the London Dental Hospital, Leicester-square. The course is arranged as follows: First and second years: Chemistry, Physics, and Dental Mechanics. Third and fourth years: Anatomy, Physiology, and Special Dental Courses, Courses in Medicine and Surgery, General Hospital Course, Dental Hospital Course.

PROVINCIAL.

Birmingham Dental Hospital, Great Charles-street.—Dean: Mr. W. T. Madin. The Dental Hospital was founded in 1858, and was recognised by the Royal College of Surgeons in 1880 for the teaching of Dental Students. Having an annual attendance of about 16,000 patients, it affords every advantage for students about to enter the profession to acquire a thorough practical knowledge, as required by the Medical Council. The present Hospital was opened on July 6th, 1905. It has accommodation for 50 students. The equipment is in accordance with the most modern requirements for the efficient teaching and practice of Dental Surgery. The operations performed annually average 35,000, including 5000 gold and other fillings, and many cases of crowns, bridges, porcelain inlays, and regulations. By arrangements with the Birmingham University and with the General and Queen's Hospitals the entire course of Lectures, Hospital Practice, &c., may be completed for an inclusive fee of £121 14*s.* 6*d.*, or including Mechanical Pupilage, £233 5*s.* 9*d.* Examination fees for L.D.S. Birm., total £22 10*s.* The instruments and materials necessary for Hospital Practice cost about £35. The Composition Fee for the courses required for the L.D.S. of the University, or any of the Corporations alone, is £75, payable in two annual instalments at the commencement of the first and second years; that for the courses required for the L.D.S. and the Degree in Dentistry of the University is £100; that for the L.D.S. in combination with the M.R.C.S. and L.R.C.P. is £106 5*s.*; and that for the M.B., Ch. B., and B.D.S. is £118 15*s.* All of these composition fees are payable in two annual instalments at the commencement of the first and second years. Each of these fees covers the cost of the courses given at the University for the qualifications indicated, but does not include fees for Hospital teaching. For two years' dental hospital practice the fee is £26 5*s.*, payable in two instalments of £13 2*s.* 6*d.* each at the commencement of the first and second (hospital) years respectively. For two years' mechanical pupilage, £111 11*s.* 3*d.*, which may be paid in two annual instalments of £65 12*s.* 6*d.* and £45 18*s.* 9*d.* respectively: mechanical pupils may join for a probationary period of one month, fee £6 11*s.* 3*d.*, which is deducted upon payment of the full amount. For general surgical hospital practice, lectures, and demonstrations: Surgery, two winters, £13 2*s.* 6*d.* One Entrance Scholarship is offered annually of the value of £37 10*s.* It is awarded to the student who, entering for the Dental Degree of the University in October, or having entered not earlier than the previous April, shall pass the best examination in the subjects studied during his apprenticeship. Candidates must be under the age of 21 years. Application for admission, together with a certificate of birth, must be sent to the Dean of the Medical Faculty, Mr. William F. Haslam, on or before Oct. 15th.

Leeds University School of Dentistry.—The School of Dentistry is fully equipped to provide training for Dental Students, and affords every opportunity for the student to prepare for any of the Dental Degrees or Diplomas. The Demonstrator of Operative Dental Surgery instructs students during their probationary course. At the completion of this training students have patients allotted to them by the Demonstrator, and have every opportunity of acquiring knowledge from the members of the Honorary Staff, two of whom are in attendance each day. The following prizes are awarded:—First year Students, value 2 guineas. Operative Dental Surgery Prize, value 5 guineas. Two prizes in Prosthetic Dentistry: (*a*) a prize, value 2 guineas, for first year pupils; (*b*) a prize, value

5 guineas, open for competition to all Students. Extraction prize, value 2 guineas, open for competition to all Students. A prize in Orthodontics, value 5 guineas, open to all Students. All communications should be addressed to the Warden, School of Dentistry, the University, Leeds.

Dental Hospital of Manchester.—This hospital is in association for teaching purposes with the University of Manchester and the Royal Infirmary, and is in the centre of a very large population. Courses of study are provided to meet the requirements of the various examining bodies, including those of the University of Manchester for the qualifications L.D.S. and B.D.S., and the L.D.S. of the Royal College of Surgeons of England. Clinical instruction is given by the members of the staff and by the house surgeons and demonstrators, and also by the honorary anæsthetists in the administration of nitrous oxide gas; a special class in anæsthetics is conducted by the clinical tutor in that subject, and a class for instruction in porcelain and gold inlay work by the demonstrator specially appointed for that work.

Ten prizes, varying in value from £2 to £12 12*s.*, are awarded annually.

For the whole course of hospital instruction for the L.D.S. (including two years' mechanical training) the fee is £131 5*s.*, paid in instalments. For the two years' Operative Course only, £26 5*s.*, paid in two instalments. For the whole course of hospital instruction for the B.D.S. degree (including mechanical training), £168, paid in instalments. Additional practice in Dental Mechanics may be taken by pupils who have already received their mechanical training elsewhere, at a fee of £36 15*s.* for six months.

All the courses of instruction are open to women students.

Copies of the Prospectus will be forwarded on application to Mr. J. Hilditch Mathews, Dean.

Newcastle-upon-Tyne Dental Hospital and School.—This hospital is centrally situated (within five minutes of the various colleges, infirmary, and railway station); the rooms are well lighted and thoroughly equipped for carrying on the work. Dental surgeons and an anæsthetist attend each morning. A tutorial dental surgeon and a prosthetic tutor is also in attendance. The Composition Fee for the special Dental Lectures and Dental Hospital Practice is £60 4*s.* if paid in one sum, or £62 6*s.* if paid in two instalments of £31 3*s.* The Composition Fee for the Lectures at the Colleges of Medicine and Science is £57 10*s.*; in addition to this there is a library and an athletic fee. Particulars of the fee for General Hospital Practice may be obtained from the Senior House Physician, Royal Victoria Infirmary, Newcastle-upon-Tyne. Medals and Certificates of Merit are granted to students showing certain standards of proficiency in the various classes at the Dental School. The prospectus of the Dental Hospital and School, containing full information, may be obtained from either Mr. J. T. Jameson, 12, Windsor-crescent, Newcastle-upon-Tyne, Dean, or Mr. James Coltman, 13, Ellison-place, Newcastle-upon-Tyne, Vice-Dean.

Devon and Exeter Dental Hospital, 24, Southernhay West, Exeter.—Established 1880.—The hospital is open on Mondays, Tuesdays, Wednesdays, Thursdays, and Fridays, and patients are admitted between the hours of 9 and 11 A.M. Students attend the practice of the hospital under the control of the medical officers. Honorary treasurer, Mr. J. M. Ackland; secretary, Mr. Albert G. Littlejohn.

SCOTLAND.

The Incorporated Edinburgh Dental Hospital and School.—The Edinburgh Dental Hospital and School is located in spacious and well-equipped buildings at 30, 31, and 32, Chambers-street and offers special advantages to dental students. The General Courses required for the Dental Diploma may be taken in the Medical School of the Royal Colleges of Physicians and Surgeons or in the University schools. The general hospital attendance and clinical instruction are taken at the Royal Infirmary. The University, Medical Schools, and Royal Infirmary are within three minutes' walk of the Dental Hospital. The special courses are taken in the hospital. The Dental Hospital practice, extending over two years, affords a student ample opportunity for a full acquaintance with every branch of dentistry. The hospital admits a limited number of indentured pupils. They receive their instruction in Mechanical Dentistry concurrently with the general and special courses. A premium of 60 guineas is payable with each such pupil. The practice and lectures of the hospital are recognised by, and qualify for, all the Licensing Boards. The cost of the hospital outfit of instruments is included in the Dental Hospital fee of £42. The minimum cost of classes and Diploma for the whole course of dental instruction amounts to £98 17*s.* Those students who desire to take a Medical and Surgical Diploma in addition to the L.D.S. have in this school admirable facilities for so doing. The triple qualification of the Royal College of Physicians and Surgeons of Edinburgh and the Royal Faculty of Physicians and Surgeons of Glasgow is recommended. The minimum cost of Professional Education, the Triple Qualification, and the Licence in Dental Surgery amounts to £172 19*s.* The Higher Dental Diploma (H.D.D.) of the Royal College of Surgeons affords an opportunity of obtaining a higher qualification subsequent to registration. The Prospectus, with full information, may be obtained by application to the Dean or the Assistant Secretary.

Incorporated Glasgow Dental Hospital, 15, Dalhousie-street, Glasgow.—The School is open to Men and Women Students, and Lectures are given on Dental Surgery, Operative Dental Surgery, Orthodontia, Dental Anatomy and Physiology, Pathology, Dental Histology, Dental Mechanics, Crown and Bridge work, Dental Metallurgy, Dental Bacteriology, and Anæsthetics. A new Radiography department has been added. Lectures on general subjects required for Dentistry may be taken at the University or at one of the extramural schools where special provision is made for Dental Students. Composition fee for two years' Hospital Practice and Lectures special to Dentistry, £50 on entry, or in two instalments of £31 10*s.* and £21. Full information may be had on application to the Dean.

Glasgow Royal Infirmary (Dental Department).—Mr. W. R. Taylor attends at the Royal Infirmary at 9 A.M. on Wednesdays and other days as arranged. The following course in the curriculum can be taken at St. Mungo's College: Anatomy, six months; Practical Anatomy, nine months; Physiology, six months; Chemistry, six months; Practical Chemistry with Metallurgy, three months; Surgery, six months; Medicine, six months; Materia Medica, three months; Clinical Surgery, six months; Dental Surgery, six months, and attendance for two years on the dental department of the hospital. The attendance on the Dental Clinic is free to students of the hospital.

IRELAND.

Incorporated Dental Hospital of Ireland, Lincoln-place, Dublin.—All Dental Students who have passed their First Dental Examination in the Royal College of Surgeons in Ireland (or an equivalent examination or examinations) are admissible to the Clinical Instruction of the Hospital. In addition to Clinical Instruction and Special Demonstrations, courses of lectures are given at the hospital on Dental Surgery and Pathology, Mechanical Dentistry, the Administration of Anæsthetics, Orthodontia, Dental Anatomy, and Dental Materia Medica. Practical instruction is also given in Anæsthetics.

Fees.—Dental Hospital Practice (each year). £18 18*s.*; Lectures, £5 5*s.* Registered dentists who are members of the British Dental Association will usually be permitted to take out a three months' course for a fee of 6 guineas. The course in practical Dental Mechanics can be taken in the Hospital Laboratory. Further particulars can be obtained from the Dean.

THE LANCET.

LONDON: SATURDAY, OCTOBER 1, 1921.

The Health Committee of the League of Nations.

THE Assembly of the League of Nations has now recast the proposals for the new Health Organisation of the League to meet political difficulties which, for the time being, prevent the accomplishment of the procedure which was settled at the first Assembly in December of last year.[1] In order to promote international measures for the improvement of public health, which is required of it by the Covenant, the League then decided to have an organisation which included a health council, with a small paid secretarial staff at Geneva, together with a consultative body on which as many national public health services as possible were represented. The latter body, which exists already in the Office International d'Hygiène Publique, was to be brought under the direction of the League, and practically was to nominate the Health Council, which in turn would appoint the Secretariat. The machinery now to be substituted, in consequence of the objections made by the United States to participating in an official organ of the League of Nations, consists of a Health Committee nominated directly by the Council of the League, and a small secretariat under a medical director, directly appointed by the secretary general of the League. To this post Dr. L. RAJCHMAN, of Warsaw, has been appointed, and the personnel of the Committee, wide nationally as well as professionally, was given in our issue of Sept. 17th. The essential advisory body, which will bring the League into touch with official public health opinion in all countries, can fortunately still be found in the Office International d'Hygiène Publique, though it remains for the present, at the wish of the U.S.A., outside the League. The Office, while remaining autonomous with its present statutes and organisation under the Rome Convention of 1907, has signified its readiness to aid the League and will be systematically consulted by the Health Committee. The two bodies already have sufficient membership in common to keep them in close touch with each other.

The main functions which the League desires its Health Organisation to fulfil are not materially changed. They are stated as follows in the resolutions which have just been adopted by the Assembly, and are to be carried out in coöperation with the Office International d'Hygiène Publique:—

(*a*) To advise the League of Nations in matters affecting health.

(*b*) To bring administrative health authorities in different countries into closer relationship with each other.

(*c*) To organise means of more rapid interchange of information on matters where immediate precautions against disease may be required (e.g., epidemics), and to simplify methods for acting rapidly on such information where it affects more than one country.

(*d*) To promote the conclusion of international agreements necessary for administrative action in matters of health, and their revision when circumstances require, and to collect information as to action taken to give effect to such agreements.

(*e*) In regard to measures for the protection of the worker against sickness, disease, and injury arising out of his employment, which fall within the province of the International Labour Organisation, the Health Organisation will coöperate with, and assist, the Labour Organisation, it being understood that the Labour Organisation will, on its side, act in consultation with the Health Organisation in regard to all health matters.

(*f*) To confer and coöperate with international Red Cross Societies and other similar societies.

(*g*) To advise, when requested, other voluntary organisations in health matters of international concern.

(*h*) To organise missions in connexion with matters of health with the concurrence of the countries affected.

The chief service which the League of Nations can render to public medicine, within the limits of the small budget allotted for the purpose, consists in facilitating combined action in matters where many Governments are interested but where no one Government can be expected to act by itself. The immediate questions with which the Health Committee of the League has already made a beginning seem to afford good examples of practical and useful work of this nature. The Committee considered it essential to effective work that the Epidemics Commission of the League of Nations should be amalgamated with the Health Organisation of the League, and this view has been accepted. The results achieved by that Commission have been of great value in preventing the spread of typhus and other epidemic diseases from Russia to Western Europe, and all information available regarding the epidemic situation in Russia at the present time points to the necessity of fully maintaining these measures and extending them wherever necessary to border States other than Poland. This is particularly requisite in consequence of the grave risks which may be run by the spread of infection of cholera from the parts of Russia now affected by famine. First-hand information is now to be secured by a visit to Russia on the part of representatives of the Commission. The Health Committee felt also that a service of epidemiological intelligence and public health statistics will form a most important part of its work, and it was decided in consequence to start an immediate inquiry to determine the best methods for collection and distribution of such intelligence. As a result of the International Opium Convention the Health Committee has accepted a reference from the Council asking it to undertake an inquiry in certain countries in which the use of morphine, cocaine, and other dangerous drugs is said to be excessive as well as in certain others in which its use is at present more probably limited to medicinal and other legitimate purposes, with a view to obtaining information concerning the average quantities that might be regarded as reasonably needed for medical use in different classes of population.

[1] See an address on International Organisation and Public Health (THE LANCET, 1921, i., 415), and International Health Problems (THE LANCET, 1921, i., 921).

Publication and Progress.

THE enormous increase in the cost of printing has put a serious obstacle in the way of the advancement of learning. From the point of view of the humanities Sir CHARLES OMAN had a good deal to say about it at the recent meeting of the Library Association in Manchester, and on the scientific side Mr. W. B. BRIERLEY, of Rothamsted, crystallises in *Nature* what everyone in contact with research work has been feeling for some time past. Serious work for the improvement of knowledge must be completed by publication of some sort unless its purpose is to be

maimed; the interested world is beyond the stage where verbal communication can possibly achieve the desirable end. But, on the whole, publication becomes less feasible as the work becomes more serious because the available public becomes progressively smaller, and it is difficult to see how many sober scientific journals are to be maintained. The great technical weeklies are subsidised by their advertisements, which incidentally are not the least useful or interesting part of their contents; in America a good many journals are helped out by endowments, a fact which explains their moderate price; journals with a big circulation, such as those of the chemical societies, have an available margin for economies. But most of our valuable periodicals have a very limited circulation, they rely on relatively small societies whose members are, for the most part, much poorer than they were and their very existence seems to be threatened.

Possible alleviations or solutions fall roughly under two heads. In the first place various plans have been suggested depending on alterations in the form of publication, and Mr. BRIERLEY has a concrete proposal to put forward. Premising that the readers of scientific papers want to acquaint themselves with either a summary statement of the author's conclusions or the fullest details of the observations on which his conclusions rest, he points out that the present method of a curtailed publication in extenso satisfies nobody; it is too full for a summary, too meagre for critical examination. He suggests that the journals should contain very full summaries with the minimum of original data necessary for their comprehension; these would be read or looked through by those generally interested in the compartment of science dealt with by the journal. For the specialist the results of the inquiry would be written up in full detail with all the original data, and these memoirs, with any germane pictures or specimens, would be deposited in some central office where they would be available for consultation by the few people really interested and competent. It is a scheme to which everyone will have a spontaneous repugnance, but if, as Mr. BRIERLEY bids us, we face reality, it may be the best way out of our troubles. It is at any rate something to be thankful for that scientific memoirs are susceptible to condensation; it is reported that the Russian novelists are reduced to reading their works aloud to those who want to listen or who cannot get away. The second line along which relief may be sought involves an alteration in the material rather than in its method of reproduction. As Mr. BRIERLEY indicates, many of the papers published are merely records of time spent and have no permanent and little (if any) temporary value in the advancement of learning. The curious and rather secretive interest in things which used to lead to discovery has been the subject of what almost amounts to a stunt; research has become a business and has to justify itself and those who engage in it. But is this really progress? Is not the real solution of the cost of printing to be found, not by curbing the rapacity of compositors as Prof. OMAN suggests, but by setting a different standard of merit for what ought to be put into type? If those contributions only were printed which really made a contribution to knowledge and, what is perhaps more important, indicated further lines of advance, much of the present trouble might disappear. The others could be printed in the briefest abstract. But the lot of editors might then be unhappier than it now is.

The cynic may remind us that some of CAVENDISH'S papers have only this year been transferred from manuscript to print and that, after all, publication does not matter very much; the pessimist, that the dull formalism into which so much of scientific literature has fallen deserves no better fate than it has met. Re-thinking is doubtless needed in several directions; the importance of publication has perhaps been exaggerated, it would be as well for scientific writers to realise that it is possible to be serious without being solemn. But someone must find a plan for making publication possible for material which deserves it.

Treatment of Stigma Diseases in General Hospitals.

IT is curious how the attitude of man towards different diseases has changed from time to time, a disease like tuberculosis, for example, being regarded by our ancestors as a pathetically genteel state to which the victims of unrequited affections were peculiarly liable. Cancer, on the other hand, was discussed by our grandparents with vague horror, and when it occurred in the family it was referred to with tactful anonymity. At the present time the subject of cancer is ventilated with call-a-spade-a-spade frankness, whereas tuberculosis has become a stigma disease, the mention of which conjures up terrifying pictures of infection, not to say contagion. The lurid colouring of such pictures has been not a little enhanced by the injudicious daubing of "compulsory segregation" heavily over the canvas. A useful corrective to this tendency is to be found in the recommendation by the American Medical Association that wards in general hospitals should be opened to tuberculous patients. This recommendation was prepared by the American National Tuberculosis Association in 1916, and its approval by the American Medical Association at its recent annual meeting at Boston marks a definite change in the attitude of the profession to this disease. It has been calculated that there are about two million known sufferers from tuberculosis in the U.S.A., quite apart from the thousands whose disease is incipient or latent and unknown. In this stage tuberculosis is often very difficult to detect, and to effect a certain diagnosis it is frequently desirable to admit the case to a hospital for a term of observation. But if this hospital be a special tuberculosis hospital, the person examined may emerge with the diagnosis of tuberculosis excluded, and yet he may not get rid of the stigma attaching to his sojourn in such a hospital. On the other hand, another person may actually be suffering from active tuberculosis in an early stage, but fear of the stigma of an avowed tuberculosis hospital may defer action till no action can secure his recovery. In a general hospital the diagnosis of tuberculosis does not become general knowledge, and the family need not be embarrassed by such knowledge. At the same time, all necessary precautions can be taken to avoid danger of infection to others. In further support of this new policy, it is said that in many small towns two hospitals, one general and one tuberculous, can be run only at a loss, whereas if combined they would pay working expenses, and the combined hospital would draw many secret tuberculous cases. A number of general hospitals could easily enlarge their facilities by fitting up porches and other open-air structures without great extra expense. The same arguments apply to the other stigma diseases, and great as is the importance of specialisation in the treatment of various diseases, this aspect must not blind us to the socio-psychological factor.

Health Insurance and the State.

THE State itself has a big responsibility in the matter—we begin where we left off a week ago. The mechanism set up under the National Insurance Acts makes it possible to carry out a concerted scheme for safeguarding the national health when the human elements in the scheme shall have all found appropriate place. To scrap this mechanism, for the State to withdraw its contribution and its directing influence, is now being seen for the calamity that it would be. It was solely the intervention of a department of State in the region of sickness insurance that opened up the sphere of public health and preventive medicine to the general practitioner. With the institution of a panel service the skill and experience of the family practitioner, unique in so many ways, was enlisted in a health service, no less truly a public health service because it bore a misleading name until it was united with the more technical Public Health Department of the Local Government Board to become the Ministry of Health. It is inconceivable that the General Practitioner Services of this Ministry should now be sacrificed in the interests of a so-called economy. The department, still in its infancy, will, we fancy, manifest the vitality of the young kitten which refuses to be drowned; if only for the reason that it is essential to the building-up of an ideal health service which has yet to include the provision of nursing, dentistry, hospital clinics, and pathological laboratories, all of which were foreshadowed when the first Insurance Act became law. Despite the urgent need of real economy, the responsibility of the State for the health of the citizen is no less than it was.

Much has been said in public and private during the week on the merits and demerits of the various human agencies which drive the mechanism. There is a reciprocal consensus of opinion that much improvement is possible. But two things stand out as noteworthy. One is the testimony of the chief organ of the approved societies that to discontinue medical benefit would be an unspeakable calamity. Our information, so writes the *National Insurance Gazette* for Sept. 17th, is to the effect that in most parts of the country medical benefit is a success. Conviction of this fact having been brought home to the critical member of the party, the value of medical benefit in the insurance scheme may fairly be considered as established for all practical purposes. The second item worthy of note is that on Sept. 23rd, at their annual conference, the group of friendly societies turned down a resolution to urge a national medical service upon the Ministry of Health, after hearing Dr. J. F. GORDON DILL set forth by invitation the provident scheme for extending hospital and additional services. All this is in harmony with the resolution to be laid before the coming Conference of Panel Committees, that the measure of success which has attended the experiment of providing medical benefit under the National Health Insurance Acts system has been sufficient to justify the medical profession in uniting to ensure the continuance and improvement of this system.

THE LANCET of January 1st, 1921.

THE Manager will be obliged to readers who have not any further use for their copy of THE LANCET of the above date if they will kindly return it to him at 1, Bedford-street, Strand, W.C.2. The postage on the number is three halfpence. He will be pleased to pay for those returned.

Annotations.

"Ne quid nimis."

PSYCHOTHERAPY IN RELATION TO MEDICINE.

THE future of psychotherapy and the place that it will eventually occupy in medicine affords an interesting subject for speculation. At present in its infancy, it has been brought to the fore, largely as the result of the numbers of cases of functional nervous disorders directly or indirectly attributable to the conditions of warfare. Psychotherapy is perhaps regarded with suspicion and distrust by some of the medical profession, either on account of its innate intangibility, the lack of definite proof of its hypotheses, or the possibilities of harm which might result from its exploitation by unqualified and unscrupulous persons. A moderate and carefully reasoned review of the subject is therefore refreshing, as there is still doubt as to its scope and limitations and the class of cases to which it is applicable. Dr. Millais Culpin gave our readers last week a reasonable presentation of the present position of psychotherapy. We would add that if psychotherapy is to play an important part in the future of medicine, it must find a place in our medical schools. It will probably always remain a specialty, but the student should receive instruction in its elements, as he does in other special branches of medicine and surgery, and he should be expected to display such knowledge, if called upon, at the time of his final examinations. If it is not deemed worthy of such attention, it can hardly yet be considered as a recognised branch of medicine. The tendency to send medical men for a short course of instruction, and to allow them then to practise as specialists in functional nervous disorders, is to be deplored. The psychotherapist should be a skilled neurologist and a sound general physician, for he will require expert knowledge before his doctrines can carry weight that such conditions as asthma are functional nervous disorders and amenable to treatment by mental exploration.

FOOD POISONING.

IN hot weather the thoughts of a medical officer of health naturally turn to the possibility of food poisoning and, if he lives in one of the larger towns, seldom is his anticipation unrealised, although many outbreaks never come to his notice. Frequently his first intimation is a note in the local press of a death from so-called ptomaine poisoning, with the consequent inquest and publicity. The more or less accidental fact that one or more of the cases ended fatally is often the only determining factor between official cognisance and investigation on the one hand and an entire absence of knowledge of the existence of an outbreak on the other. It is important to realise the complete lack of machinery for the official recognition of these outbreaks, mild or severe, as the extensive number of outbreaks which must occur and which remain uninvestigated is undoubtedly one important contributory reason why so much in their ætiology remains unexplained. Another factor retarding a fuller knowledge is the continued use in the lay press, by medical men, and even by health officers, of the term ptomaine poisoning, which suggests changes in the nature of putrefaction as in some way ætiologically concerned. Such a conception diverts inquiries into channels which lead nowhere and prevents investigations which might throw essential light upon paths of infection. Objection to its use is not purely academic, since its retention is a hindrance to progress. Dr. W. G. Savage has dealt decisively with this matter in his recent book on Food Poisoning and Food Infections. He pointed out that ptomaines are late degradation products of protein decomposition only produced when food is far too nasty to eat, that there is no evidence that ptomaines or other toxins produced by the breaking

down of proteins by putrefactive bacilli are harmful when administered by the *mouth*, and that the whole conception is based upon injections under the skin.

It is well attested that in the majority of food-poisoning outbreaks the food is perfectly good in appearance, taste, and smell, and that evidences of decomposition are usually conspicuously absent. On the positive side all outbreaks, or at least all the larger ones which have been scientifically investigated, have been traced to the activities of specific bacilli, nearly all of them members of the salmonella group. While this point has been definitely established it still leaves very many factors in their causation unexplained. One essential problem which has to be solved is as to the source and channels whereby the infecting bacilli gain access to the food. It is this vital factor that most of the recorded outbreaks leave undecided. In a very few instances a human source of infection has been detected; this was the case in the Lambeth outbreak investigated by Dr. J. Priestley in Aug. 1920.[1] In a considerable number (especially on the Continent, where food supervision is more thorough) the food has been traced back to a diseased animal, but in the majority there is no evidence at all as to any source of infection. This cannot be ascribed to the use of meat from a diseased animal but unrecognised as such, since in many cases the evidence is convincing that the animal was healthy and infection was subsequent to slaughter. In some cases the food is not of animal origin at all; in others it was harmless at first and only poisonous subsequently. The sources of infection in these outbreaks can only be unravelled by searching and elaborate investigation of all channels of infection. In this and other directions there are many gaps in our knowledge and until they are bridged the prevention of these distressing outbreaks is likely to remain in its present unsatisfactory state.

This being the present position of our knowledge we welcome the arrangements which have been made recently between the Ministry of Health and the Medical Research Council for the fuller investigation of the conditions which give rise to illness produced by bacterial food poisoning. The inquiry will be undertaken by medical officers of the Foods Section of the Ministry, under the direction of Dr. A. W. J. MacFadden, in coöperation with Dr. W. G. Savage, under whom the investigations will be made at the University of Bristol by a special investigator. Medical officers of health and medical men are invited to make use of these facilities for the investigation of outbreaks through Dr. MacFadden or Dr. Savage at Weston-super-Mare. We reprint on p. 727, for the convenience of readers, the instructions given in the circular of the Ministry of Health for the collection and transmission of specimens to the laboratory.

CHEMICAL WARFARE.

THE disaster last week at Oppau in the Rhine Province has recalled attention to one of the terrible episodes of the war, for whatever was the actual source of the explosion, the Ludwigshafen Aniline Works were notorious as one of the principal manufactories of poison gases. During actual hostilities, chemical warfare is an engrossing occupation to a large proportion both of attackers and defenders, as well as a painful concern to the whole civilian community. In times of peace it naturally tends to lose interest except for small groups of strategists preparing for the next campaign, chemists interested in toxicology, humanitarians who are out to prevent any campaign at all, and doctors whose duty it is to stand by in any event to anticipate and prevent bodily suffering and disability. The problem is a baffling one. It would be logically convenient to limit a discussion on chemical warfare to the view-point of any one of these groups, but the borderland is apt to be crossed. This was notably the case with the protest made at Edinburgh by the President of the British Association against the diversion of the brains employed in the promotion of his science to the perfecting of means for destroying mankind. Sir Edward Thorpe brushed on one side the sophistical talk about the painlessness or temporary effect of poison gas, and made a dignified appeal to the Association to set its face against the continued degradation of science in augmenting the horrors of war, and to use its influence in resisting a course of action which is the very negation of the civilisation which natural knowledge has done so much to build up. It is surely idle to dally with the notion that any effective form of chemical warfare can be genial or humane. The offensive agents devised in the laboratory are useful from the military point of view in proportion to their power to maim, torture, and kill the enemy, and their moral effect on him is in proportion to the horrors of their physical effect. Although it seems plainly wrong-headed to refuse to recognise that the objections which should reasonably prevent civilised nations from using phosgene or mustard gas are equally cogent against the employment of high explosive shell or any other recognised agent of destruction, allowance must be made for the psychological difference between using what you have and trying to devise something "better." As those engaged in the study of natural science will be the first to admit, nothing can remain as it is; if there is no progress decay inevitably follows. The implications involved in the continued prosecution of chemical warfare are of an order which may properly be described as fundamental. It is a question not only of the progress of chemical research but of the continuance of civilisation. It should be recognised that what Sir Edward Thorpe protests against is not a possibility but a reality. There is in existence a War Office organisation for the prosecution of research in the offensive and defensive aspects of chemical warfare with which are associated some 50 or 60 chemists, physicists, physiologists, and medical men. Their experimental ground near Salisbury is still in being. Whether anything of offensive military value is being discovered is naturally not known; progress along defensive lines is obviously as impossible as to discover the cure for an unknown disease. The scientific members of this Chemical Warfare Committee may find food for reflection in what Sir Edward Thorpe has said.

[1] THE LANCET, 1920, ii., 364.

THE SPREAD OF HUMAN COCCIDIOSIS.

IN 1915 H. M. Woodcock announced the discovery of a human coccidium in a man who had been invalided from Gallipoli. The discovery was quickly confirmed by G. C. Low and C. M. Wenyon, while the latter demonstrated that the coccidium belonged to the genus *Isospora*. Since that time a number of cases have been described from different parts of the world, and having encountered a case in the Philippines, Dr. F. G. Haughwout reviews[1] the situation and shows that practically all the cases can be traced either directly or indirectly to the Eastern Mediterranean area and that this coccidium has now circumnavigated the globe. Such is the influence of the war in spreading infections. Infections in men who had been in the Eastern Mediterranean war area have been recorded in England, Italy, Egypt, Salonika, and America, while in India they have been noted in men returning from Mesopotamia. In all these cases it appears that the infection was contracted in Turkish territory. In America, however, C. A. Kofoid discovered infections not only in men who had been abroad but also in others, so that it would seem that the infection may have been established in this country. A case recorded by F. Noc from West Africa was in a man who had been a prisoner of war in Germany, and the writer believes that the infection may have been contracted from other prisoners from the Eastern Mediterranean.

[1] A Case of Human Coccidiosis detected in the Philippine Islands, with Remarks on the Development and Vitality of the Cysts of *Isospora hominis* (Rivolta). By Frank G. Haughwout. The Philippine Journal of Science, April, 1921.

The case seen by the writer in the Philippines was in a man who had come from the United States and who had never before been abroad, and it is concluded the infection was picked up there. The only cases which cannot even indirectly be connected with the war are two described by Porter in natives of South Africa. It remains to be seen whether the parasite which has been distributed about the world will now take a firm hold in distant countries with creation of new endemic centres. There appear to be four other coccidia of man, but they belong to the genus *Eimeria*, like the common coccidium of the rabbit, and are much more rarely met with than the *Isospora*. As regards the investigations recorded by the writer, he has little new information to add to what is already known. He has shown, however, that the oöcysts of *Isospora* can withstand exposure to a tropical sun for three hours, during which complete desiccation of the material in which they occur takes place. The oöcysts of coccidia are notoriously resistant structures and complete drying does not prevent the development which must take place outside the body in order that they may bring about infection when swallowed by another human being.

SILICOSIS AMONG STONEMASONS.

THE discovery that dust-phthisis is only associated with the inhalation of silica dust narrowed the issue in relation to this disease so that the claim for compensation of workers became irresistible. The provisions of the Workmen's Compensation Act, 1906, were found not to be applicable to a disease so slow in onset; moreover, experience had shown certain defects in the working of this Act. Powers were therefore obtained in 1918 to grant compensation for dust-phthisis, or, as it should more correctly be called, silicosis or silicosis complicated by tuberculosis. Under the new Act different machinery is established to meet the liability imposed; any industry brought under its provisions is called upon to insure itself by some approved scheme to which all members of the industry are obliged to belong. Liability can no longer be transferred by insuring with some company; action on these lines in the past has not resulted in employers looking upon the liability as an incentive to preventive measures. The first scheme accepted under this new Act, that applying to the "refractories" industry, has made medical supervision of the workers, as well as compensation claims, a charge upon the employers. The medical supervision established is exerted by the officers of the tuberculosis authorities in the areas where the industry is carried on. Probably similar provision will be made in schemes made applicable to other industries as the powers of the 1918 Act are extended by order of the Secretary of State. Steps in this direction are already being taken.

The Safety and Welfare Committee of the Industrial Council for the Building Industry, of which the members were directed in November, 1920, to consider whether stonemasons should be brought within the scope of the Workmen's Compensation (Silicosis) Act, 1918, have now presented a preliminary report on the subject. A memorandum was prepared for the committee by Prof. E. L. Collis, and communications were sent to various associations and bodies concerned with the work of stonemasons; conferences were held with the Joint Industrial Council for the Quarrying Industry and with several trade-unions, and after further information from these and from other sources has been received and considered a further report will be issued. The above-mentioned memorandum is included in the report, and contains interesting details of the subject under consideration by the committee. During the years 1910–1912 there were in England and Wales 6559 deaths from all causes out of a total of 99,274 stone-getters, dressers, and masons aged 25 years and over. The normal percentage of deaths due to phthisis and fibroid disease among all males of similar ages was less than 12; at that rate about 780 masons would have died from these causes, whereas 1135 masons actually died—an excess of 355 cases in three years. Had the Compensation Act applied to masons it is reasonable to suppose compensation for death would have been payable for at least this number, together with compensation for various degrees of disablement in a larger number of cases. The Act, framed for provision of compensation to persons suffering from silicosis and from silicosis complicated by tuberculosis, applies only to such industries and processes as may be determined by the Home Secretary. The inhalation of silica dust results in a high incidence of fibroid disease, and of phthisis which frequently is implanted upon it, among gold-miners, tin-miners, ganister-miners, and brick-makers, all of whom deal with quartzite rock; among grinders of metal, who use sandstone wheels; among potters and flint-knappers, who work with flint; and among the stonemasons in whose interest the inquiry was particularly undertaken. Of stones used in building, sandstones contain silica in high proportion, granites contain a low proportion, and limestones are practically free. Thus the distribution of deaths among masons is strikingly irregular, depending on the district inhabited and the stone worked. In order to avoid misleading inferences due to the age-distribution of any particular class of worker, the Registrar-General has prepared figures for a "standard population"—i.e., the actual number of males of all classes living at the various age-periods—enabling fair comparison to be made between the respective death-rates of masons and of the general population. The figures afford material for considering whether or not to include members of the building industry under the workings of the "Silicosis" Act.

A MEDICAL BENEFACTOR.

THE sudden death on Sept. 22nd from heart disease of Sir Ernest Cassel has removed a man with a natural aptitude for acquiring wealth and the rare faculty of bestowing it where needed. Born in 1852, the son of a Cologne banker, he became the friend of British medicine. Only in the spring of this year he gave £225,000 to found and endow at Penshurst a hospital for functional nervous disorders. He was a liberal contributor to the Red Cross and to King Edward VII. Hospital Fund for London, twice giving £50,000 to the Fund. He built and endowed the sanatorium at Midhurst, which bears the name of King Edward VII., and made it possible to start the Papworth Industrial Colony for Consumptives. The Radium Institute owes largely to him and to Lord Iveagh its supply of that precious element, amounting to several grammes. Other benefactions, not so well known, were no less well placed.

CAUSES OF DENTAL DECAY.

THE Medical Research Council, in consultation with the Ministry of Health, have appointed the following Committee for the investigation of the causes of dental decay: Prof. W. D. Halliburton, M.D., F.R.S. (chairman); Mr. Norman G. Bennett, M.B., L.D.S.; Dr. Leonard Colebrook; Dr. J. M. Hamill (secretary); Sir Arthur Keith, M.D., F.R.S.; Mrs. May Mellanby; Mr. J. Howard Mummery, M.R.C.S., L.D.S.; Dr. C. J. Thomas.

The appointment of the Committee will be welcomed by all who have at heart the improvement of the physique of the nation. It has been the custom for some time for medical officers of health to class dental decay among the preventable diseases, but there has been no unanimity as to how prevention is to be secured. At one time "tooth-brush drills" were fashionable, but now there is a tendency to regard the tooth-brush with some fear as a source of septic trouble and to rely upon finishing the meal with a so-called tooth-cleansing food. If tooth-brush drills have served no other purpose they have certainly acted as an advertisement—perhaps like baby shows in the case of infant welfare—of the urgent need for something to be done. An increasing body of

enthusiasts lay most stress on the building up of good sound teeth, which will resist decay, by means of more careful attention to the dietary of childhood and adolescence. The committee appointed is a representative one, and we do not doubt that its findings will give a great and much needed stimulus to the campaign against this extremely important cause of ill-health and physical disability. Sanitary reformers, who know the far-reaching effects of dental decay and oral sepsis, have been anxiously waiting for a lead.

OSWALD SCHMIEDEBERG.

THERE is something pathetic in the fact that Oswald Schmiedeberg should have outlived the post of professor of pathology in the German University of Strassburg, which he held during the whole period of German occupation from 1872 till 1918. Born in Kurland in Russia in 1838, he died after a short illness on July 12th of this year at Baden Baden, where he had gone to live near his friend Naunyn. Even the German medical papers seem to have lost him in his retirement, for they do not report his death till September. He was a prolific writer himself, and the articles inspired by him would be difficult to count. He is known for his theory that alcohol is in no sense a stimulant of the central nervous system, but that it depresses from the beginning, dulling the highest centres first and the medullary centres last of all, the so-called stimulant effects being merely due to depression of the inhibitory centres. He was less happy in his advocacy of organic iron compounds. His well-known Arzneimittellehre, translated into English in 1887 as "Elements of Pharmacology," has served as a model for text-books on pharmacology. Schmiedeberg's life was bound up in his institute and his scientific work, and he was one of a group of German scientific workers who have formed a school round them by attracting students from all parts of the world. Cushny and Stockman studied under him in Strassburg. While not coming into the class of Pasteur, Ehrlich, and Koch, he was certainly one of the great pioneers of experimental pharmacology.

MEDICAL EVIDENCE FOR THE DEFENCE.

Sir Edward Marshall-Hall, K.C., in addressing the jury on behalf of a medical man[1] charged with administering drugs to women for an illegal purpose, made the interesting suggestion that the Medical Defence Union should organise a rota of medical men who would be prepared to give evidence on behalf of an accused person, or to give the advantage of their knowledge to the court. In saying this Sir Edward Marshall-Hall appears to have had in his mind the power of the Crown to assemble medical witnesses against a prisoner, and the inability in many cases of a prisoner to obtain expert evidence on his behalf through lack of means. He referred, no doubt, to all classes of accused persons and not only to medical men, who generally can obtain such evidence owing to their professional position. He meant also, we presume, that such evidence should be given gratuitously. From a medical point of view the suggestion is rather attractive. It is certainly a hardship that a man's liberty should be placed in danger for lack of a medical witness able to criticise the medical evidence given for the prosecution and to put the medical aspect of the prisoner's case in a more favourable light. The giving of such aid as is indicated might, in conceivable cases, be a work of the truest charity. Whether the innovation would be generally practicable and welcomed by all parties is a slightly different matter. Sir Edward Marshall-Hall has had very great experience, perhaps greater than any other present member of the Bar, in the defence of difficult criminal cases. One would like to ask him whether, apart from the particular case that he was fighting, and the needs of a particular client, he would wish to see the system instituted which he has suggested, and considers that it would prove workable in practice. Probably in many instances the suggested medical witnesses would agree with the evidence given by the witnesses on behalf of the Crown. Further questions suggest themselves for consideration. Would the fact that such witnesses were not called prejudice the defence, and would the jury be unduly influenced against a prisoner by their absence? Would they be regarded as putting themselves forward as professional witnesses for the defence, and would the weight of their evidence be lessened thereby? It would be useful to know whether other counsel of experience in criminal courts agree with Sir Edward Marshall-Hall.

[1] THE LANCET, Sept. 24th, p. 677.

SMALL-POX AND VACCINATION.

AT the present time a considerable proportion of the English people are under the impression that small-pox is no longer to be looked upon as a formidable disease, and that they may safely ignore the Vaccination Acts. The present generation has had no object-lesson of epidemic small-pox, and consequently has no fear of the disease; the belief appears to be widely prevalent that small-pox is to be reckoned among the diseases which have practically become extinct in England and Wales in consequence of the high standard of sanitation now exacted by local health authorities. The former ravages of variola in this country in pre-vaccination days are not realised—the heavy mortality of children, the blindness among many of the survivors, the facial disfiguration, along with other sequelæ. Nor does it appear to be generally recognised that small-pox is continually manifesting itself in epidemic form in one or another part of the world, that the infection is constantly being carried by shipping from one continent to another, and that England, from its geographical position and its world-wide commerce, is peculiarly exposed to the risks of imported small-pox.

To dispel this ignorance and remove the misapprehensions which have arisen in the public mind is a course that is obviously necessary in the interests of public health. Something could be done to improve the present situation if the public were put in possession of trustworthy information concerning small-pox and vaccination. Probably it has been with this object in view that the Medical Department of the Ministry of Health has prepared for circulation a small pamphlet [1] on this subject, written in plain and concise language, and summarising the main facts concerning small-pox and its only prophylactic—vaccination. An account is given of the behaviour of the disease in pre-vaccination days, and a description of how inoculation was tried and found wanting, how vaccinia was introduced by Jenner, and what were the early experiences of it in this country. There is also given a brief résumé of the present administrative arrangements for vaccination in England and Wales, and a short description of the Government Calf Lymph Establishment. Perhaps the most interesting section is that which deals with the present state of vaccination in the population of this country. In this connexion our readers may remember that the Royal Commission on Vaccination, in its final report presented in 1896, recommended that exemption should be granted to those parents who honestly believed that vaccination would be injurious to the health of their children. The Vaccination Act of 1898 therefore contained a provision allowing exemption in cases in which the applicant satisfied the magistrates that his conscientious objection was a genuine one. The Act of 1898 also instituted domiciliary instead of stational vaccination, and made obligatory the use of Government glycerinated calf lymph by public vaccinators. These concessions resulted in a better observance of the vaccination laws, and the percentage of vaccinations to births,

[1] Reports on Public Health and Medical Subjects, Ministry of Health, No. 8. Small-pox and Vaccination. London: H.M. Stationery Office. 1921. Pp. 19. Price 3d.

which in 1898 was 61·0, had risen in 1905 to 75·8. About this time a Bill was introduced into Parliament relaxing the conditions under which exemptions could be obtained, and the Vaccination Act of 1907 made the getting of an exemption a mere formality, so that it was obtainable by any parent. All that the parent now does is to fill up the form and hand it to a magistrate for signature, no questions being asked by either party. In this way unthinking and selfish parents make use of the exemption clause in order to shirk their responsibilities to their children, and evade some small and temporary inconvenience to themselves. The effect of the 1907 Act has been to make vaccination in many districts a dead letter. In 1919, the last year for which figures are as yet available, the percentage of vaccinations to births had fallen to 40·6. From the statistical tables given in the pamphlet of the Ministry of Health, it appears that in the 10 years 1910 to 1919, allowing for those who have died, there still remain 2½ millions of children who have been "legally" exempted from vaccination, and who are therefore totally unprotected against small-pox. Moreover, by the operations of the 1907 Act a further 250,000 exempted children are being added every year to the unprotected population of this country. We are therefore rapidly reverting to the conditions which existed in pre-vaccination days. The pamphlet of the Ministry of Health should be spread broadcast.

THE GROWTH OF BIOCHEMISTRY.

RECENTLY we have devoted an increasing amount of space to reviews of books and journals dealing with biochemistry. Last week it was a new text-book by Dr. Benjamin Moore and an issue of the *Biochemical Journal*; this week it is the *Journal of Biological Chemistry*, which is strong on the side of technique. The recent meeting of the British Association gave great attention to biochemistry. "The Laboratory of the Living Organism" was the title of the presidential address to the Section of Chemistry, and a joint meeting of the Sections of Chemistry and Physiology was opened by Prof. F. G. Hopkins with a paper on Oxidations and Oxidative Mechanisms in Living Tissues. We are thus confirmed in the belief that biochemistry in its fullest sense is of fundamental importance not only in the daily life of every citizen, but still more in the special field of medicine. Nowadays, biochemistry is all-embracing, including as it does the fundamental principles of organic chemistry (from which it is derived); of inorganic and physical chemistry; together with such particular branches as food analysis (including the question of vitamins), sewage treatment, industrial fermentation processes, the changes occurring in blood coagulation, immunity, digestion, secretions of special glands. Few of our readers will be able to follow continuously all this modern work and the journal abstracts are offered on this account. Chemistry has always been intimately associated with medicine, but with the rapid development of the two subjects they have recently grown apart; happily, the connexion is again being established by the progress of physiological chemistry. The extension of biochemistry will necessitate modifications in the teaching in our medical schools. At present there is little or no coördination during the several years of study and even less scope for post-graduates to take up a particular branch for further knowledge and research. It is not easy to find a solution to this problem of ever-increasing demands upon teachers and students, but some radical change must be made. This alteration might consist, in the first place, in the appointment of a biochemist as professor of medical chemistry, who should coördinate and be responsible for the whole range of chemical subjects in the medical curriculum. With a suitable staff the early part consisting of inorganic and organic chemistry, the intermediate part of physiological chemistry, and the final parts of pathological chemistry and hygiene, could be welded into a succinct and shorter course than is provided at present, with the elimination of much encumbering material. At the same time the department should offer sufficient accommodation to post-graduates for special work and to permanent research workers. All needs would thus be met. Departments of medical chemistry planned on such a basis would attract younger men as assistants, who, in course of time, would become familiar with the whole range of the work and ultimately become the chiefs. The same department in our universities could undertake the general chemical course for students of botany and, if required, provide for advanced work with suitable assistance. Though organised as an independent whole, contact should be maintained with physiology, pathology, and other medical subjects. Under the existing arrangements, with each branch under the care of a separate lecturer, there is little opportunity for the several chemical teachers to become acquainted with the whole range of medical chemistry. They cannot take the proper interest in the medical side of the subject and have to seek eventually other appointments unconnected with medical science. Moreover, a chemist who has had no training in physiology lacks real sympathy with the medical curriculum and the subject of medical chemistry is stultified. If professorships of medical chemistry were founded at each medical school medical chemistry would flourish amazingly.

SPIROCHÆTES IN PERIODONTAL DISEASE.

IN the *Dental Cosmos* for September, Kritchevsky and Ségun give some interesting facts with a bearing on the pathology of periodontal disease. In syphilitics with clinically healthy gums they found no spirochætes, but of 24 cases where there was characteristic periodontal disease 22 showed spirochætes, and in 70 per cent. of these cases the spirochætes disappeared after the administration of neosalvarsan. As a result of further investigation the authors are of the opinion that spirochætes in association with the *Bacillus fusiformis* are the primary cause of all necrotic conditions of the gum margins, the process of destruction being completed by pus-forming aerobic and anaerobic cocci. The authors do not consider there is one specific spirochæte but several varieties. A number of experiments were conducted on guinea-pigs, the secretion being taken from different affections of the mouth, such as pyorrhœa alveolaris, Vincent's angina, mercurial stomatitis, and injected subcutaneously. Characteristic abscesses were obtained, sections of which showed, in the centre, pus containing cocci, spirochætes, fusiform bacilli, and vibrios. Outside this was a layer of total necrosis exclusively filled with fusiform bacilli; beyond this, again, a zone of greatly altered tissue filled with fusiform bacilli and spirochætes; then a zone with but few fusiform bacilli; and, finally, a region with pure spirochætes only. From their observations the authors came to the conclusion that in the first place there is an invasion by spirochætes which, by their toxins, prepare the tissues for the final destructive and necrotic action of the fusiform bacillus. The tissue is then secondarily infected by different aerobic and anaerobic cocci.

LUNACY CONTROL.

THE annual report for 1920 is the seventh issued by the Board of Control since its inception in 1913. In May, 1920, the bulk of the powers of the Secretary of State under the enactments relating to lunacy and mental deficiency were transferred to the Ministry of Health, and the Board rejoices not only in the administrative advantages thus gained but in the hope that this step may help to dispel prejudice and may ensure the linking up of preventive measures and after-care with curative treatment. The close association with the Ministry of Health may serve to create

and maintain a hospital atmosphere convincing to the sufferers, to their friends, and not least, to the officials who have charge over them. The insane would then be regarded as patients rather than prisoners, even in those cases where the primary object of their segregation is the protection of society; when once detained, their restoration to health is alone important. This is the acknowledged atmosphere at hospitals for infectious diseases and might become universal at mental hospitals. On the preventive side, the Board deplores the collapse of Dr. Addison's Miscellaneous Provisions Bill in so far as its rejection involved a clause relating to the treatment of incipient mental disorder. There seems little doubt that some at least of the 22,373 new cases, admitted to institutions or under single care during 1920, could have been saved from certification had there existed some way of dealing with them in the early stages. This figure and that of the discharges cured, relieved, or "not recovered" (the destination of these 3276 persons remains obscure, unless transfers are included under this heading), show very little variation from those of the previous year. The total increase of 3580 in notified insane persons under care is accounted for mainly by a decrease in the death-rate. Recoveries numbered 7206, or 32·21 per cent. of the total direct admissions.

The condition of the patients in public asylums and the arrangements for their care and treatment have, as a rule, proved satisfactory to the Commissioners at their annual visits. Complaints of harshness or rough usage have been rare, and after searching inquiry justification for such complaints appears to have been even rarer. Dissatisfaction with the quality, monotony, and cooking of the food supplied seems to have been more widespread, and in some instances justified; the Board has pressed for improvement in this matter. The desirability of the nursing of male patients by women having been questioned, the Board has carefully considered this subject and concludes that under suitable circumstances the arrangement may be markedly beneficial. On the result of the special inquiry into the conditions and treatment of service patients in Prestwich Asylum we have already commented;[1] other criticisms have also been carefully investigated, a useful result being the unqualified condemnation of cold baths as correctional treatment. Considering the number of suicidal cases under detention, the number—22 persons—who managed to kill themselves while in residence does not seem high, especially as 15 of these were not regarded as suicidal; five others were so trusted as to be allowed about by themselves on parole, and two only were known to have active suicidal impulses. The cases of dysentery (1085) were fewer than those recorded for any year since 1908, when they numbered 1068. The lack of institutions for mental defectives remains an acknowledged blot in our system of dealing with abnormal members of the community. When employment is restricted it is the feeble and inefficient who suffer first, and, moreover, the presence of a large number of unprotected feeble-minded women must inevitably lead to the spread of venereal disease. Recognising that the need for national economy will prevent any direct advance on these lines at present, the Board urges local authorities at any rate to proceed with and to complete the work of ascertainment, in order that when funds permit no time shall be lost for lack of information.

Appendices contain statistics of the patients resident in asylums, hospitals, and houses, and of the expenditure incurred on their behalf, and also lists of the county and borough asylums, hospitals, and licensed houses with names of medical superintendents, clerks, and so forth; while in a supplement 15 pages are devoted to details of scientific research work. Inasmuch as the greater part of this work has been or will be published elsewhere, this space might with advantage have been allocated to extracts from the Commissioner's reports of their annual visits. Publication of Part II. of the report, which includes these, has been suspended for reasons of economy; certain statistical tables, also omitted, will be available for inspection in the offices of the Board. The reports of the Commissioners are, it is stated, mostly printed in the annual reports of the several institutions, but they would form instructive reading when taken collectively, and we regret their omission from an otherwise clear and adequate volume.

[1] THE LANCET, 1920, ii., 1153.

RECENT OPHTHALMOLOGY IN FRANCE.

THE French genius for elegant precision makes ophthalmology a congenial study. Dr. F. Terrien gives us a useful summary[1] of the progress of ophthalmology in France for the last year. Many of the subjects dealt with bear relation to general medicine and surgery. According to Prof. Achard, the most constant symptom of encephalitis lethargica is paralysis of the accommodation. The papilla is sometimes, but not always, affected with a moderate degree of neuritis. The anatomical seat of the lesion is usually the mid region of the mesencephalon round the aqueduct of Sylvius, when hæmorrhages are found near the vessels. In a case of retro-bulbar neuritis in a girl of 12, Dr. Netter found an alteration in the blood, the red corpuscles being reduced to one-half and the white being increased to threefold the normal, the condition being ameliorated by treatment directed to the anæmia. In a case of irido-choroiditis, an examination of the blood revealed the meningococcus some days before the supervention of any symptoms of meningitis. An observation recorded by Dr. A. Tournay in 1917 that inequality of the pupils is a physiological phenomenon when the eyes are directed to either side has been confirmed, the eye which is directed outwards towards the temple having the larger pupil. The fact that the phenomenon is found not only in healthy eyes but in blind ones points to its being not a true reflex but an associated movement of the pupil like contraction to accommodation. Coming to more exclusively ophthalmic observations, Morax and Fourrière record the results of sclero-iridectomy in hospital practice. In 16 cases of acute glaucoma, Holth's operation was performed in 12 and Elliot's in three. Tension was reduced to normal in all, but Elliot's method proved more efficacious in producing a filtering cicatrix. In subacute and chronic cases the same held good roughly. After 12 Lagrange operations there were 3 filtering cicatrices, after 22 Holth operations 6, and after 41 Elliot operations 22 filtering cicatrices. Late complications were rare, numbering only 5 after 500 operations.

[1] Paris Médical, Sept. 3rd, 1921.

Sir Frederick Andrewes and Sir Cuthbert Wallace have been appointed to fill the vacancies on the Medical Research Council created by the retirement in rotation of Mr. C. J. Bond and Prof. William Bulloch. The new appointments date from Oct. 1st.

THE Dental Section of the Students' Guide, for which space could not be found in our issue of August 27th, appears in our present issue. We commend it to the attention of the parents and guardians of intending dental surgeons. The future of dentistry is bright with possibilities.

WE print on p. 732 the names of some hundreds of medical men and women whose present addresses are not known to the Registrar of the General Medical Council. These practitioners are running the risk of having their names removed from the next issue of the Medical Register, and they should take immediate steps to keep their registration entry up to date. Removal from the Register has sundry inconvenient consequences on which we have often insisted.

Public Health Services.

THE MARRIAGE BAR.

THE injustice that may be involved in the application of a general principle to a particular case is well illustrated by current events in the Borough of St. Pancras. The Borough Council recently passed a resolution to terminate the appointments of married women on their staff whose husbands are in receipt of salaries sufficient to support their wives. This resolution is now found to apply to the assistant medical officer for maternity and child welfare, and the Ministry of Health, which pays half her salary, was asked to sanction a request to Dr. Gladys Miall-Smith to resign her post in view of her recent marriage. The Minister observed in reply, that, while the proposal did not require his sanction, he considered that in view of the special qualification and capability of Dr. Miall-Smith, and the present shortage of women medical officers trained in this work, the Borough Council would be well advised to retain her services provisionally if their rules permitted. The case as put by the assistant medical officer herself was, briefly, that no marriage disqualification or resignation clause was inserted either in the advertisement of the post which appeared in the medical press in January, 1920, or in the forms of application or appointment submitted to her; that in fact a married woman was among the three applicants finally selected by the Public Health Committee. She points out that the attitude of the council up to the present has led her to suppose that they concurred in the general view that marriage was an added qualification for any work connected with maternity and child welfare, inasmuch as a large proportion of the doctors appointed and paid by the council to work at the infant-welfare centres, and in particular those recently appointed, are married medical women. Moreover, there being no unemployment problem at the present moment amongst medical women, the question of her keeping a single woman out of employment does not arise. Since her appointment Dr. Miall-Smith has obtained the D.P.H., thus further qualifying herself for the work she undertakes. Letters in support of her claim were received by the Council from the British Medical Association, the Society of Medical Officers of Health, the Federation of Medical Women, the National Association of Local Government Officers, the London Society for Women's Service, and the superintendents of local welfare centres. The arguments in these letters were largely amplifications and extensions of those advanced by Dr. Miall-Smith herself, except in so far as they emphasised her exceptional qualifications, efficiency, and local popularity. The British Medical Association urged that, whatever the council's attitude on the general question of the employment of married women, there could be no doubt of their suitability for child-welfare work, and asked that the council should seriously consider the advisability of retaining Dr. Miall-Smith's services. The Federation of Medical Women spoke of the special suitability of work with fixed hours for married women, and of the value to the community of one who may have intimate knowledge of children of her own; also of special arrangements whereby absence for confinement would involve no loss to ratepayers. Eventually, after some discussion, the decision to ask Dr. Miall-Smith to resign was upheld. It remains to be seen whether the council will now proceed to ask for resignations from the married women doctors employed by them at the local welfare centres and whether they will presently extend this attention to married men in their employment whose wives are in receipt of salaries sufficient to support their husbands.

WOMEN PRACTITIONERS AND A RESTRICTED PANEL.

Early in the year four women practitioners on the London medical list, preferring not to undertake the treatment of men patients, were deprived of 7½ per cent. of their share in the practitioner's fund, and this in accordance with the terms of the 1921 contract as interpreted by the London Insurance Committee. We expressed a doubt at the time whether Section 5 of the Distribution Scheme was intended to have this construction placed upon it. Later the Committee decided that, subject to the approval of the Ministry of Health, a reduction of 3¾ per cent. only in the practitioner's credit should be involved in the limitation of the panel list to patients of one sex. The Ministry have approved the amendment of the clause by the addition of the words: "by 3¾ per cent. in the case of a woman practitioner limiting her list to patients of her own sex." As the converse case is hardly likely to occur the Ministry presumably decided to legislate in this instance for women only.

SCHOOL MEDICAL SERVICE.

Leicestershire.

IN this county the school nurses carry out the duties under the Notification of Births Act; they are also inspectors of midwives and infant life protection visitors. The school doctors, too, are medical officers to the infant welfare centres, in this way ensuring coöperation of effort in dealing with children from birth to the end of school life. Dr. T. Robinson, however, has to deplore the number of changes in the nursing staff. During the past year over 12,000 children were submitted to routine examination; of these, 684 required treatment for defective vision, 487 for enlarged tonsils and adenoids, 673 for dental disease, and 93 for ear troubles. Six hundred and forty-four of the defective vision cases obtained treatment, 473 of those suffering from enlarged tonsils and adenoids, 299 of them being operated on. Out of 6899 children dentally inspected, 3092 were referred for treatment and 2791 actually treated. A central dental clinic is about to be opened in Leicester for the treatment of children on Saturdays; it will be interesting to see with what success, as Saturday clinics so far have not proved popular.

Leeds.

The total cost during the past year for medical services was high—just over 8*s.* per head of attendances at the elementary schools. The efforts of the late Dr. W. Angus, when medical officer, are bearing fruit and Leeds is coming into line in respect of care for its children. Children found to be defective seem to be given some six weeks in the hope that the parents will provide remedy; then they are marked off to clinics—Leeds excels in clinics. Seven of these had 174,446 attendances, and this total apparently does not include cases of enlarged tonsils and adenoids, for which the authority does not provide treatment. On the fate of these "no definite information is available." Dental attendances were 16,735, making a total of over 190,000. The work of the school nurses appears very satisfactory; two-thirds of their time is spent in the clinics, and only one-tenth in home visits. This determined effort to clear diseased conditions out of the schools is not equalled by preventive measures, for although there are some playground classes and nine play centres Leeds has no open-air schools, which would be much appreciated in a town. Other lacunæ, such as absence of schools for cripples and for epileptics and classes for the dull and backward, are also noticed. A house has, however, been purchased to serve as a nursery school. The number of children examined during the year was 26,759 in the elementary schools and 1792 in the secondary and special schools. The total number of cases referred for treatment was 14,528, defective vision accounting for 2366 and uncleanliness for over 3000. Ten per cent. of the secondary school children were suffering from malnutrition. It is unfortunate that the medical officer does not attend the advisory committee for juvenile employment, where his advice would be helpful.

Northamptonshire.

The most noteworthy feature of the school medical work this year is the new scheme for dental treatment

which proposes to deal, as a start, with children of 6 and 7 years of age, including a few older children. It is hoped, however, that all children will eventually be passed under review each year. During the year it was found that only 31·8 per cent. of the children had sound teeth, as against 32·4 per cent. last year; amongst "leavers" the rate was only slightly higher, 34·3 per cent., as against 35·8 the previous year. Under the new scheme this percentage should be considerably raised in a few years' time. Normal vision was found among 77·4, and normal hearing in 99·8 per cent. Operative treatment was received by 41 per cent. of the nose and throat cases, and Dr. Charles E. Paget urges regular breathing exercises as a routine part of physical education in the schools. There were 13 definite cases of pulmonary tuberculosis in the county. Physical deformities were detected in 1 per cent. of the children examined, and in addition 1·6 per cent. were found to be suffering from heart disease. There was a marked diminution in the amount of anæmia amongst leavers, 0·67 per cent., as against 2·6 per cent. the previous year. During the year 59 schools were closed for measles—in this county the old order evidently still prevails in the case of infectious disease.

INDUSTRY AND PREVENTIVE MEDICINE: CONFERENCE AT OXFORD.

A CONFERENCE organised by the Industrial Welfare Society was held at Balliol College, Oxford, from Sept. 15th to 20th. Here, sent by their firms, there were gathered for a few days in college life representatives of great industrial concerns, including engineering works, textile mills, railways, coal mines, shipbuilding yards, chemical works, and food factories. The programme included lectures by distinguished experts, but much solid work was done at informal meetings of groups held in rooms or in the quadrangle which were always taking place from morn to midnight; indeed a far more businesslike atmosphere was present than is usually found at scientific conferences.

The proceedings were opened by Lord GORELL, who announced that acceptance of office in the Air Ministry had necessitated his retirement, in favour of Lord Chelmsford, late Viceroy of India, from the Chairmanship of the Miners' Welfare Committee established under the Mining Industry Act, 1920. He dwelt upon the epoch-marking provision of this Act which makes a levy on the industry to be devoted to betterment purposes, and sets up a committee to allocate the fund. The scope of the work is to include education, health and safety, recreation, and research, so covering the whole field of human life.

Industrial Welfare as a Science.

The correctness of this view of welfare was shown by the subjects dealt with by other speakers; thus Dr. C. W. KIMMINS (London County Council) dealt with the educational aspect and pointed to the magnificent opportunity opening up before welfare supervisors as juvenile education under the 1918 Act comes to be carried on part-time with occupational life, and to the scope so afforded for vocational guidance. The theme so opened was developed on the industrial side by Mr. ERIC FARMER, who claimed that industrial psychology could be considered as a continuation of education, that it should be concerned with the human element and not be tied down by the needs of efficiency or production. Efficiency and production will certainly benefit, but this benefit should not be the only aim of industrial psychologists and physiologists; their aim should be to improve industrial activity and discover the boundary where activity becomes overstrained, the parent of irritability and discontent.

The principles of physiology underlying health were laid down by Prof. E. L. COLLIS (Cardiff), who pointed out the part the public can play if only these simple principles are grasped. He claimed that industrial welfare was a science, although yet a young one; he pointed out that no science could exist without means of measurement. The means in this case were labour turnover and lost time. He urged welfare supervisors to use these means and become masters of them; through them research could be carried out, without which the welfare movement could not progress. He uttered a warning that a science which was not progressing must become retrograde.

The subject of recreation was taken up by Mr. R. S. WOOD (Secretary of the Juvenile Organisations Committee), who dealt with camping—the rightful heritage of every boy. He placed before the conference much useful and practical information on the economic running of camps, and advocated that two or three smaller camps were more advantageous than one large one. Another aspect of recreation was delightfully demonstrated by Mr. G. J. SHARP, a well-known authority on folk dances and folk music. Only the best of these dances and songs have come down to us. Their value becomes apparent from the way in which they are quickly adopted and practised when once they are introduced. Play is as necessary to life as work, especially in a country long known in Europe as Merry England. Folk dances and songs which have stood the test of centuries should not be disregarded in favour of modern and less tried forms of recreation.

The Practice of Welfare.

The strength of the industrial movement was, however, made more obvious when it was spoken of by employers such as Sir ANDREW DUNCAN (Shipbuilding Employers' Federation), and representatives of labour, Mr. F. BRANLEY (Trade Union Congress) and Mr. F. S. BUTTON. In each case the speakers presented their point of view with what they thought some temerity. Each welcomed the welfare movement, but saw the necessity for limitation of its activities. The surprising matter was that when the two positions were thus stated no conflict whatever was found, nor did either position conflict with the work which welfare supervisors are undertaking. Both Sir Andrew Duncan and Mr. Branley considered that welfare work should concentrate upon juveniles, and only seek to permeate industry as these juveniles grow up to adult life and carry with them the spirit which welfare has implanted. Sir Andrew Duncan particularly pointed out that the outward form of welfare work was of minor importance compared with the spirit, and with recognition that there is an obligation and burden upon an industry with regard to the welfare of those engaged in it which it must itself discharge. Mr. Branley's point of view was that organised labour would give its unqualified support, without reserve, to genuine schemes of factory and workshop welfare. He looked upon the welfare movement as the ally of organised labour, working in a field particularly its own. There could be no doubt that an employer who became an enthusiast for welfare could not at the same time advocate low wages or unreasonably long hours.

Aspects of the subject put forward by different speakers were all submitted to keen discussion. The duty lay with Mr. R. R. HYDE (Director of the Industrial Welfare Society) to report present progress. He was able to state that the movement, which saw its birth in the stress of war-time and grew during the trade boom that followed, had held its own in a wonderful way during the unprecedented slump from which we are only just beginning to emerge. Now he could state that firms who have once adopted welfare were continuing it whatever the conditions of trade. Apart altogether from its high aims and aspirations as a branch of social service, welfare had value in providing common ground upon which employers and employed could meet in amity.

Those who attended this Conference could not help being struck by the earnestness and enthusiasm which inspired it. All present were bent upon ensuring the success of what promises to be the foundation of a new spirit of health and contentment in the industrial world.

FOOD POISONING OUTBREAKS:

MEMORANDUM ON THE COLLECTION AND TRANSMISSION OF SAMPLES.

A CIRCULAR letter issued by the Ministry of Health to medical officers of health on Food Poisoning Inquiries includes a memorandum by Dr. W. G. Savage, setting forth how to obtain and transmit specimens. Outbreaks, it is stated, differ so much in character that uniformity of requirement in regard to specimens is not possible, but the following should be collected.

(1) *Any Portions of the Supposed Peccant Food.*—These should be actual portions remaining over from the food which caused the illness. Even small scraps, remains in tins (if a tinned food) are better than nothing. Samples of food of similar origin are usually of little assistance but occasionally are useful.

(2) *Post-mortem Materials from Fatal Cases.*—The spleen, pieces of liver, piece of small intestine, kidney, are the most useful. The stomach (ligatured) with unopened contents is valuable if metallic poisoning is suspected, but not of much use otherwise.

(3) *Pathological Material from the Cases.*—From all cases, and especially when (1) is not available, and (2) only problematical, endeavours should be made to collect and transmit material from the actual sufferers while in the acute stages. The samples should be excreta samples and vomit. Of these, excreta samples are both the easier to obtain and the more valuable.

(4) *Samples of Blood for Serological Examination from the Sufferers.*—There is no urgency about these samples since any serological reactions persist for many weeks, while in any case they will not develop until a week or more after the onset. It is better, therefore, to wait to collect these samples until after the bacteriologist has the other samples, and also the preliminary information as to the outbreak, so that he can indicate exactly what he requires.

Transmission.

Outfits are available at the Bristol Laboratory, but usually there will not be time to send for these, and the transmittors must use their laboratory outfits or an emergency one. Excreta specimens can be sent in clean wide-mouth bottles. The food can be put in a clean tobacco tin. The organs from fatal cases should each be wrapped in a piece of clean cloth wetted and wrung out (only damp, therefore) with 1 in 500 corrosive sublimate solution. All the organs can be placed so wrapped in one large tobacco or other tin. Outfits for blood samples will be sent from the laboratory.

If possible, the samples should be sent packed in ice. An impromptu ice box can be made by using a fairly large biscuit tin, and packing the tins and bottles in one side of this and filling the other part with dry ice in small pieces. The tins and bottles must be secured from rolling about when the ice melts, by means of cloths and wood partition, or other device. The biscuit box should be packed in a wood box with at least two inches everywhere of sawdust between the two boxes. If ice is not procurable the samples must be sent without it rather than delay.

Samples should be sent by passenger train to Mr. Bruce White, Pathology Department, University of Bristol, who should be informed at once by telegram of their despatch, and, if possible, of the time of arrival, so that everything may be in readiness at the laboratory.

BUDAPEST.

(FROM OUR OWN CORRESPONDENT.)

The Prevention of Summer Diarrhœa.

Dr. Blumenfeld, who is in charge of a large children's hospital, had this year an unusually large number of cases of diarrhœa under his care. He ascribed the increased incidence of the complaint to the excessive heat, which reduced infantile resistance and promoted the multiplication of bacteria in milk. In an address on the subject he outlined the general care of the infant during this period, the necessity of open air, cool clothes, cleanliness, properly prepared milk, and suitable intervals of feeding. He detailed the contents of a leaflet to be distributed to mothers and physicians, and suggested instruction in the schools, especially the high schools, of matters relating to infant hygiene, and also proposed that the milk commissioners now appointed in several cities should be increased in number. He suggested the idea that a municipal model dairy, under medical supervision, and a milk plant which would sell to the poor at cost price, should be established in every city. He condemned wholesale pasteurisation, as the numbers of bacteria in milk actually increase under this treatment, whereas home pasteurising does not have the same effect.

The Heroin Habit.

Dr. Vidakovich notes the variety of cases of addiction to heroin, and reports one occurring in his practice. The patient was a spinster, aged 41, of nervous heredity, to whom the drug had been given as an anodyne with the assurance that there was no danger of forming a habit. She continued to take the drug after the original indication for its use had disappeared, and when coming under treatment was giving herself 0·06 g. hypodermically in divided doses daily. A cure resulted from immediate withdrawal with symptomatic, sustaining, and eliminative treatment. The abstinence symptoms were, however, so severe that Dr. Vidakovich observes that in future he would resort to gradual withdrawal.

Morphine-Scopolamine Narcosis.

Dr. Frater, surgeon at a large provincial hospital, one of the most conservative operators in the country, states that morphine and scopolamine alone as a narcotic are hardly ever safe, the dose of the former drug being too high. Small doses are, however, highly to be recommended if followed by one of the usual anæsthetics (morphine hydrochloride, 0·01 to 0·02 g.; scopolamine hydrobromide, 0·0005 to 0·001 g., in fresh solution). Either chloroform or ether may be used, but the advantages of ether are perhaps more marked. The excitation stage is shorter, less anæsthetic is necessary, salivation is never troublesome, and the danger of post-operative pneumonia is considerably diminished. Some 800 cases have been reported, with a mortality of 1 per cent., but many of the patients were already in a moribund condition when operated on. It may also be advisable to resort to the two drugs in smaller doses in Schleich's infiltration anæsthesia.

Headache the only Symptom of a Case of Malaria.

Dr. Sümegi, who recently returned from imprisonment in Russia, reports a peculiar case of malaria, without temperature symptoms, occurring during a severe Siberian winter. The patient was his brother, a sergeant; the only symptom he complained of was headache, which appeared each forenoon and lasted a few hours. The patient had no previous malarial infection. Dr. Sümegi had no occasion to examine his brother's blood, nor did he suspect the presence of malaria. However, when the brothers were returning through Moscow, Dr. Sümegi visited a friend of his, a hospital bacteriologist, who advised an examination of the blood. This was accordingly done; no perfect organisms were shown, but numerous malarial spores were present, which rapidly disappeared, together with the symptoms, under quinine. Dr. Sümegi regrets that the blood examination was not made earlier, and the exact character of the parasite determined; the appearances indicated the tertian organism.

Favourable Health Conditions in Budapest.

The death-rate in this city for the first six months of this year was considerably lower than for the corresponding period in 1920; but for scarlet fever the figures would have been the lowest for many years. The death-rate for the past six months was 19·75; for 1920, 21·68; and for 1903, 19·14.

Rabies in a Horse.

Rabies is supposed to be uncommon in horses. In a small village among the Carpathians a horse was recently bitten by a rabid dog. Although inoculated

by Pasteur's method typical symptoms of the disease developed 40 days after the bite. The animal survived for five days. The manifestations, which were carefully observed, were almost the same as in man; the cramps could, however, be checked for six to eight hours by administration of a large dose of salvarsan (4·5 g.).

Grippe as an easy Diagnosis.

Dr. Kovacshazi has expressed the opinion that most of the cases called influenza are ordinary colds, which it has become a fad to speak of as grippe. In a number of cases in which microscopical examinations were made for the bacillus it was found once only, and that in an unsuspected case. It would be a blessing if the term "grippe" were now abandoned; it is applied to every form of affection that occurs as the result of cold weather, from cold in one nostril to terminal pulmonary tuberculosis. Grippe is a soothing diagnosis to make. It prepares the family for the worst at once. Any number of complications may occur, and the doctor can scarcely be held responsible. It would be better if the affections seen were called by descriptive names such as laryngitis, pharyngitis, and bronchitis.

Sept. 14th.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Comdr. W. S. H. Sequeira is placed on Retd. List at own request, with rank of Surg. Capt.

The following appointments are announced: Surg. Lieut.-Comdrs. A. R. Sharrod to *Collingwood*; and A. E. Malone to *Kellett* (temp.).

ROYAL ARMY MEDICAL CORPS.

Temp. Lieut.-Col. A. Simpson relinquishes his commn. and retains the rank of Lieut.-Col.

Maj. A. G. Cummins retires on ret. pay.

The undermentioned temp. Capts. relinquish their commns. and retain the rank of Capt.: R. T. G. Aickin and N. W. Furey.

J. M. Semple to be temp. Lieut.

SPECIAL RESERVE OF OFFICERS.

The undermentioned Capts. relinquish their commns. and retain the rank of Capt.: G. R. Hubbard, C. G. J. Rayner, and I. H. Zortman.

TERRITORIAL FORCE.

Maj. A. B. Sloan resigns his commn. and retains the rank of Maj., with permission to wear the prescribed uniform.

Capt. D. Dickie resigns his commn. and retains the rank of Capt.

ROYAL AIR FORCE.

Flight-Lieut. H. J. Swan relinquishes his temporary commn. on ceasing to be employed, and is permitted to retain the rank of Capt.

INDIAN MEDICAL SERVICE.

J. Rodger (late R.A.M.C.) to be Capt.

The King has approved the relinquishment of their commns. by the undermentioned officers and the grant of rank as shown: Capt. Nagendra Nath Maitra, and are granted the rank of Capt. on relinquishing their commns.: Maneck Sohrabjee Hormusjee Mody, Narayan Raghanath Satpute, Khagendra Mohan Basu, and Narayan Hari Kulkarni.

DONATIONS AND BEQUESTS.—The governors of the Manchester Children's Hospital during the past month have received donations and legacies totalling £2117, which includes a sum of £1203 from the Manchester and Salford Hospital Sunday Fund.—The late Mr. George Marsden, of Birkdale, Lancs, has bequeathed £500 to the Children's Sanatorium, Southport.—By the will of the late Mr. John Joyce, J.P., Wallasey, Cheshire, the Liverpool Royal Infirmary will receive £500, the David Lewis Northern Hospital and the Royal Southern Hospital £250 each, and the Victoria Central Hospital, Liscard, £400.—Under the will of the late Countess Eldon, of Tilehurst, Bucks, the testatrix left £500 to the Cripples' Fund of the Lord Mayor of London, £500 to the Victoria Hospital for Children, £500 to the Cancer Hospital, £500 to the Hospital for Diseases of the Heart, £250 to the Evelina Hospital for Sick Children, and £250 to the National Anti-Vivisection Society.

Correspondence.

"Audi alteram partem."

X RAY TREATMENT OF OTOSCLEROSIS.

To the Editor of THE LANCET.

SIR,—I have read with interest Dr. J. H. D. Webster's article on the X Ray Treatment of Otosclerosis in your issue of Sept. 24th, for we must all agree with Gray's remark, which he quotes, that in this disease we are "confronted with one of the most difficult and obscure problems in modern medicine." Nevertheless, I regret that he has published his article at this early stage, for it is likely to raise premature hopes among the numerous unfortunate sufferers from this affection, and to embarrass those practitioners who do not wish to experiment with a new method until there appear more solid grounds for expecting a successful result, for the a priori reasons for believing that the early stages should be amenable to radiation treatment do not seem very convincing. As it is well known that long stationary periods occur in this disease, Dr. Webster's two cases are much too recent to base any conclusion thereon. Prof. Siebenmann himself, whose method Dr. Webster has followed, finds the results "only to a small degree positively encouraging," and wisely states that "his trial of the method has not continued long enough for him to come to a definite conclusion." Neither has he as yet published his technique, which Dr. Webster is therefore unable to quote in print. On these grounds it is wise to accentuate the note of caution which, it is fair to say, Dr. Webster sounds in his paper.

I am, Sir, yours faithfully,

HAROLD BARWELL.

Queen Anne-street, W., Sept. 24th, 1921.

THE DANGERS OF THE PUBLIC SWIMMING BATH.

To the Editor of THE LANCET.

SIR,—Your annotation on the Swimming Bath and Catarrhal Otitis in THE LANCET of Sept. 3rd, and subsequent correspondence from Dr. Dan McKenzie and Dr. F. W. Alexander have served to revive the important questions of the dangers resulting from the pollution of public swimming baths and their prevention. The subject was dealt with at some length in a paper read by me over nine years ago which was fully discussed at a meeting of the Medical Officers of Schools Association and published in *School Hygiene* in May, 1912.[1] This paper was based on bacteriological examinations of the water from a small swimming bath in use at one of the London County Council's Industrial schools. The number of boys using the bath daily varied from one to two dozen, each soaping himself over thoroughly before going in. The water was changed twice weekly, but no disinfectant was applied. The unpolluted water taken shortly after filling the cleansed bath yielded a count of about 100 organisms per c.cm., chiefly of the *Proteus* group, whereas the samples obtained after the bath had been in use for two to three days gave an average of 1000 organisms per c.cm., among which *Streptococcus fæcalis*, *Staphylococcus pyogenes aureus*, *B. coli communis*, *Proteus*, as well as Gram-negative diplococci occurring in normal saliva, and certain skin contaminations, were isolated and identified, alike from the polluted water and the slime deposited on the floor and sides of the empty bath. Reference was made to investigations carried out by Drs. G. H. Pearce and Sutherland[2] on the water of the public swimming bath at Batley in Yorkshire in June, 1910, where the degree of microbic pollution was found to vary considerably, according to the class and number of persons using the bath and their condition of cleanliness. Bacterial counts ranging from under 3000 to about 300,000 organisms per c.cm.

were obtained on different occasions. Among them were found coliform or intestinal flora, *B. enteritidis sporogenes*, *Staphylococcus pyogenes aureus*, *Streptococcus pyogenes* and *Proteus vulgaris*. The bacteriological evidence of bath water pollution provided by these two independent investigations, it was claimed, pointed to the possible causation of such inflammatory conditions as otitis media, conjunctivitis, &c., and the further possibility that the contaminated bath water might well become a vehicle of other infections, notably diphtheria, influenza, tuberculosis and enteric fever, despite the want of clear proof of such mode of infection. The purification of swimming baths was fully discussed, and in particular the method employed in Poplar, as introduced by Dr. Alexander and referred to in his letter of Sept. 17th, was strongly advocated for universal use. Its value was also emphasised in the discussion following the paper and the whole subject was recommended for further investigation. This recommendation was met in November, 1912, by the report on "The Purification of the Water of Swimming Baths" issued by a committee of the Royal Sanitary Institute, as already mentioned by Dr. Alexander. In this report the risk of massive infection to bathers by swallowing the recently ejected mucous discharges of persons suffering from disease, and the ease with which among other results catarrhal or septic conditions of the nose, throat and ear might supervene, were pointed out. The treatment of bath water by hypochlorite of magnesia solution, or the electrolytic fluid used at Poplar, was fully investigated and very much impressed the committee with the good results obtained.

Since the date of this publication and until the recent correspondence in your columns the subject, though undoubtedly one of considerable hygienic importance, has been allowed to lapse in this country. It has, however, received some attention in America. S. C. Markley, in his M.Sc. thesis at Yale University in 1913, described the value of the use of chloride of lime in the purification of swimming baths and the method of its application. In January, 1917, Dr. W. A. Manheimer [3] published a paper in the *American Physical Education Review* from the Research Laboratory of the New York Department of Health on a "Comparison of Methods for Disinfecting Swimming Pools." His report included results of investigation as to:—

1. Ultra-violet light, on the value of which he was unable to form a decided opinion.
2. Lectrocide, obtained through electrolysis of brine and mainly composed of sodium hypochlorite—found to possess a high coefficient of disinfection.
3. Copper sulphate—1 part to 100,000 of the water—showed the least efficiency and highest cost of all chemicals used in pool disinfection.
4. Chlorine gas, injected into tap water feeding the pipe to the pool, was proved to yield high efficiency at very low cost and was easily applied. Calcium hypochlorite was found for similar reasons to be very efficacious.
5. Ozone was thought likely to be of considerable value and was to be the subject of future tests.

In the same publication a year later "The Sanitary Aspects of the Swimming Pool at Cornell University" were considered by Henry N. Ogden [4] and the few instances of alleged transmission of communicable disease were quoted. Among these were the prevalence of influenza, colds, sore-throat, and occasionally pneumonia, restricted to users of the swimming tank in the North Western University, noted by W. L. Lewis, and a mild epidemic of typhoid fever ascribed to swimming bath infection and reported by R. J. Reece in the Local Government Board Reports, 1908–1909, also affections of the nose and ear among members of the swimming team at Brown University in 1910 described by Bunker (comparable, indeed, to the recent outbreak of conjunctivitis and catarrhal otitis among members of the swimming club at Freiburg as described by Amersbach, the subject of the annotation in THE LANCET of Sept. 3rd). Ogden's paper includes an account of bacteriological tests applied to swimming bath water at Cornell and a number of other American Universities, together with the methods of disinfection employed. The results were described as unqualifiedly convincing of the value of the disinfectant used (solution of chloride of lime yielding one and a half parts available chlorine per million gallons) and of the good quality of the water so treated. As far back as 1898 an outbreak of acute contagious ophthalmia was described by Vaginsky as having been conveyed by children in a public bath in Berlin, where also in 1899 the spread of granular ophthalmia was reported as due to swimming bath infection. A similar connexion was suggested as responsible for the occurrence of conjunctivitis among children at one of the London industrial schools in 1912, but the evidence was not conclusive. The risk of ear infection which has been strongly urged by Dr. Dan McKenzie is no fanciful one, and is incurred alike in the public swimming bath and in sea bathing. Attention has been drawn to the latter by H. V. Blackwell in a paper published in the *Medical Record* of 1916, entitled "The Salt-water Ear," and a warning is uttered against the danger of otitis media, occurring particularly among those with a history of previous ear trouble or subject to otorrhœa.

At the risk of trespassing too much on your valuable space I would quote the following case of acute meningitis which I saw some 12 months ago in a girl of 14, who provided in striking and tragic fashion clear evidence that the swimming bath was directly responsible. In previous good health and with no history of past ear trouble the girl visited a public swimming bath on a Thursday, earache being complained of on the next day. On Saturday afternoon, when I first saw her, the left ear was discharging, she was unconscious with definite signs of meningitis, further demonstrated by the fluid obtained from lumbar puncture. Death occurred the following morning.

It is much to be hoped in the interests of the very large numbers using the public swimming baths that the publicity which the correspondence in your columns has given to the subject of swimming bath pollution may lead to the universal adoption by the responsible authorities of some such system of purification as is so successfully carried out at Poplar.

I am, Sir, yours faithfully,

J. GRAHAM FORBES.

Savoy-hill, W.C., Sept. 22nd, 1921.

References.—1. The Pollution of Swimming Baths, School Hygiene, vol. iii., No. 2, May, 1912. 2. THE LANCET, August, 1910, p. 542. 3. Amer. Phys. Educ. Rev., p. 22, January, 1917. 4. Ibid, p. 5, January, 1918. 5. Medical Record, 1916, vol. lxxxix., p. 912.

THE ERLANGEN TECHNIQUE IN X RAY THERAPY.

To the Editor of THE LANCET.

SIR,—Having just returned from Erlangen after a week of study of the methods of deep X ray therapy as practised there, notably in the treatment of malignant disease, it might be interesting to others if I record my personal impressions. In the first place, the X ray therapy devised by Prof. Seitz and Prof. Wintz differs radically from that generally practised in this country. In conjunction with the manufacturers, they have devised an apparatus and tubes capable, with suitable filtration, of giving out, and of sustaining, homogeneous rays—that is to say, rays the absorption of which (and therefore the therapeutic effect) is more or less uniform per centimetre of tissue traversed. They have been able, by the iontoquantimeter, to ascertain the exact proportion of the skin dose that is absorbed at varying centimetre depths. They have demonstrated that there must be a *definite* unit skin dose (U.S.D.) which causes certain *definite* effects, and that there is a *definite* percentage of this U.S.D. (which they designate as 100) which is lethal to the cancer cell, another percentage which causes the death of sarcoma cells, and so on.

The whole process is mathematical and accurate, but to secure results special apparatus is required. The ordinary X ray outfit, however powerful, if

designed for radiography or fluoroscopy, is essentially unfitted for the work, as it is constructed to give as large a *quantity* (milliamperage) as possible through a medium tube for a short time, while for these treatments a small milliamperage, through an excessively hard tube, is required for hours consecutively. The method of measuring the rays is also special, as these very hard rays—filtered as they are through 0·5 mm. zinc (=about 12 mm. aluminium) cannot be measured by Sabouraud pastilles, which are, according to Prof. Sidney Russ, "hopelessly transparent to very penetrating types of radiation." Dr. Charles Guilbert, in his recent work on deep therapy, agrees with the Erlangen school that the only reliable method of measuring X ray dosage is that based on ionisation (iontoquantimeter). It is only by some such means as this that it is possible to estimate accurately what percentage of the dose falling on the skin is absorbed, and is therefore of therapeutic value at varying depths in the tissues.

Deep therapy, similar in principle though at times differing in the details of the technique, is being practised at most large continental hospitals; there are five installations suitable for the treatment in constant use at the late Prof. Wertheim's clinic in Vienna. From what I saw at Erlangen I am of opinion that this treatment of malignant disease offers, in suitable cases, as good results as regards cure and the absence of the likelihood of metastasis as Prof. Wintz claims.—I am, Sir, yours faithfully,

J. CURTIS WEBB,
Hon. Radiologist, Gloucester Royal Infirmary.

Sept. 22nd, 1921.

THE COUGHING CUP.

To the Editor of THE LANCET.

SIR,—I should like to endorse the suggestion of the "coughing cup" for the prevention of tuberculosis contained in the letter of Dr. T. M. Allison in THE LANCET of Sept. 17th. But I would go one further and suggest that everyone suffering from a cough should use a coughing cup. Post-mortem findings and the Pirquet reaction support the hypothesis that the tubercle bacillus is ubiquitous among civilised communities and that everyone is infected at some period of his existence and possibly a danger to the community while carrying the organism. I further suggest that the cough spray is the *chief* mode of infection and that the apparently non-tuberculous, being in the large majority, are responsible for the widespread dissemination of the bacillus to at least an equal extent as the obviously tuberculous. A few of the apparently non-tuberculous are incipient cases without physical signs or signs sufficient to bring them under the scrutiny of a medical officer, but the great majority of this class, although reacting to the Pirquet test, never develop the disease as it is known to the clinician. It has been demonstrated how the meningococcus can pass through a community under certain conditions—namely, those of overcrowding and bad ventilation, and that the process is accelerated by the presence of coughs and colds. The inference that the tubercle bacillus, which is so widespread in its distribution, is disseminated in the same manner as the meningococcus is strongly supported by facts.

I am, Sir, yours faithfully,

D. H. C. GIVEN, M.D., D.P.H.,
Surgeon-Commander, R.N.

Sept. 19th, 1921.

ROYAL MICROSCOPICAL SOCIETY.—A conversazione will be held at the Mortimer Halls, Mortimer-street, London, W., on Wednesday next, Oct. 5th, from 7.30 to 10.30 P.M., the President, Prof. John Eyre, receiving the guests. A preliminary programme of meetings for the coming session has been issued. The papers to be read include one by Dr. Lancelot T. Hogben, entitled Preliminary Account of the Spermatogenesis of Sphenodon; a paper by Prof. Eyre on Microscopy and Oyster Culture, and one by Mr. Joseph G. Barnard on the Future of the Microscope in Medical Research. Further information can be obtained from the hon. secretaries, Mr. J. G. Barnard and Dr. J. A. Murray, 20, Hanover-square, London, W. 1.

Obituary.

CAREY PEARCE COOMBS, M.D. LOND.

THE death of Dr. Carey Pearce Coombs, of Castle Cary, Somerset, has removed a familiar figure from the ranks of the medical profession in the West Country. Dr. Coombs was born at Frome, where he went to school. At the age of 14 he was apprenticed to his uncle, who was practising in the same town, and two or three years later went to St. Mary's Hospital, Paddington. This school was then in its infancy, and the successes gained by the young Coombs at the University of London (honours in several subjects in the First M.B., and a final pass at the age of 21) were all the more welcome. During these years he lived with and assisted Mr. Fitzpatrick in Lisson-street, near the Edgware-road. He was assistant demonstrator of anatomy at St. Mary's, and subsequently house surgeon, but any hope of promotion to the honorary staff was frustrated by the death of his father, which made it necessary for him to take a share in his uncle's practice in 1865. He went to live at Beckington, near Frome, and in 1866 married Mary Leslie, daughter of Mr. William Franklin, of Coventry. In 1867 he took a small practice, one of several then existing in the town of Castle Cary. After passing his M.D. in 1869, Coombs gradually absorbed the other practices, and was in active work till 1911, when he retired, after a seven years' partnership with Dr. David Price who succeeded him.

During this period of 44 years he endeared himself to the whole neighbourhood, not only by his professional efficiency, but also by his kindly and unselfish disposition. He held various local appointments, among them the medical officership to the Castle Cary district of the Wincanton Union, and the Ditcheat district of the Shepton Mallet Union. His principal contributions to medical literature dealt with electro-therapeutics, in which he took the greatest interest. In 1875 Sir William (then Dr.) Broadbent, in his preface to the seventh edition of Tanner's "Practice of Medicine," stated that the section on electro-therapeutics had been written by his "friend and late pupil, Dr. C. P. Coombs." Twenty years later the subject of his presidential address to the Bath and Bristol Branch of the British Medical Association was "Galvanism in the Treatment of Neuritis," an address which he expanded into a small volume, published in 1896. Although he held no public health appointment, he was largely responsible for securing for Castle Cary a safe water-supply, and was the first chairman of the water company formed in 1908.

Throughout his life the character of Dr. Coombs was marked by a singular catholicity of temper as of taste. Brought up as a Free Churchman, he attended the Congregational Chapel at Castle Cary from the time when he settled in the town until his death. For nearly 50 years he was treasurer to the Chapel, and in many other ways gave his services to the cause. In spite of this fidelity to conviction—a course difficult for a young doctor to take in a country town 50 years ago—he made numerous friends among those of other persuasions, and was wont to say that the proudest moment of his life was that in which he had been helped into his overcoat by four rural deans! For many years he was president of a non-sectarian men's adult school. He was fond of music, and for nearly 30 years was president of the local choral society which he helped to found. Among his other hobbies were painting and wood-carving. He was no mean archæologist, and in a neighbourhood affording unlimited material for such studies he was an unerring guide.

After his retirement in 1911 he was made a Justice of the Peace, and chairman to the Castle Cary school managers. He was also chairman of Messrs. John Boyd and Co., Ltd., for many years, and trustee of the Jubilee Cottages founded by that firm for their superannuated workpeople. His personal appearance

was striking. Tall, big, and ruddy, with a kindly expression, he looked, as indeed he was, the incarnation of all that is best in British medicine.

Though for some months his strength had been failing, Dr. Coombs's final illness was brief and painless. He died on Sept. 13th, in his eightieth year, leaving his widow and four children to mourn their loss. His only son is Dr. Carey F. Coombs of Bristol.

JOHN WARD COUSINS, M.D.LOND., F.R.C.S.ENG.,
CONSULTING SURGEON TO THE ROYAL PORTSMOUTH HOSPITAL.

Dr. J. Ward Cousins, whose name is well known to the medical profession both as a general surgeon and as a medical politician, died on Sept. 22nd. The second son of the Rev. T. Cousins, an Independent minister, he was first apprenticed to Dr. E. J. Scott, surgeon to the Royal Portsmouth Hospital, and then in 1853 entered as a medical student at St. Thomas's Hospital, where three years later he gained the Cheselden medal. In the same year he qualified M.R.C.S.Eng. and L.S.A. In 1858 he graduated M.B. at the University of London, taking the M.D. in the following year. A year later he became F.R.C.S.Eng., by examination. After holding a resident appointment at the City of London Hospital for Diseases of the Chest he became attached to the staff of the Royal Portsmouth Hospital in 1863, and to the Portsmouth Eye and Ear Infirmary. From 1895 to 1899 he was a Member of Council of the Royal College of Surgeons of England and their representative on the Central Midwives Board. In the affairs of the British Medical Association Dr. Cousins took a lifelong interest; he was for many years hon. secretary of the Portsmouth division, becoming president of the Central Council, and president of the Association on the occasion of its visit to Portsmouth in 1899. His wide range of interest is reflected in his writings, which include a Review of the Treatment of Stone, the Treatment of Tinnitus Aurium, Ectopic Gestation, and Tuberculous Disease of Joints. A variety of surgical instruments which he invented or improved bear witness to his inventive genius, being rewarded by a British Medical Association prize and by a gold medal at the International Inventions Exhibition. He was on the Commission of the Peace for the borough of Portsmouth. Able surgeon, faithful colleague and good citizen, his place will be hard to fill.

WILLIAM ARTHUR LOXTON, M.B., CH.B. BIRM., F.R.C.S. EDIN.

THE death of Dr. W. A. Loxton took place last week at Budleigh Salterton, where he was on holiday. Dr. Loxton was educated at Birmingham University, where he took the degree of M.B., Ch.B. in 1904, having qualified M.R.C.S. Eng., L.R.C.P. Lond. in 1887. He served as house surgeon to the Queen's Hospital, Birmingham, before specialising in diseases of the skin, which, with venereal diseases, formed his principal interest. He was appointed to the honorary staff of the Birmingham Midland Hospital for Skin and Urinary Diseases in 1890, and for the last three months of his life was the senior member of the staff. He was also medical officer to the Birmingham Venereal Clinic, and the author of several publications dealing with venereal diseases. Dr. Loxton was at one time president of the Midland Medical Society. He leaves a widow and a daughter.

BENJAMIN POPE VIRET, M.B. LOND.

Dr. Benjamin Pope Viret, who died on Sept. 16th at his residence in Horton-lane, Bradford, Yorks, bore the name of his father, a well-known civil servant, and was educated at St. Paul's School and St. Bartholomew's Hospital. He became M.R.C.S. Eng., L.R.C.P. Lond. in 1890, and graduated M.B. Lond. in 1893. After an appointment as house surgeon to the Dorset County Hospital he entered into private practice in the city of Bradford, where he remained for the last 24 years of his life. He was a referee for the Pearl and other insurance companies and one of the factory surgeons in the city. While engaged in his professional duties he contracted an infected wound, which set up septic pneumonia, from which he died with tragic suddenness. A cultured man of wide reading and fond of his profession, Dr. Viret did not seek publicity. He was 54 years of age and leaves a widow and three children.

ROBERT A. FLYNN, F.R.C.P. IREL.,
CAPTAIN, ROYAL ARMY MEDICAL CORPS.

THE death occurred last week of Captain R. A. Flynn who, before the war, was a well-known gynæcologist practising in Dublin. Having taken his medical qualifications in 1887, Flynn served the usual period as Assistant Master in the Rotunda Hospital, and then began practice in Dublin. He was for many years gynæcologist to the Drumcondra Hospital. Early in the war he accepted a commission in the Royal Army Medical Corps and, liking military work, he accepted re-engagement in preference to demobilisation after the armistice. For the past two or three years he was stationed in Dublin. He suffered for some time from heart disease, but his death came as a surprise to his many professional friends in Dublin.

THE LATE DR. T. B. STEDMAN.—Thomas Bernard Stedman, late deputy coroner for N.E. London, who died at his residence, Sheffield, on Sept. 21st., aged 49, had been an honorary demonstrator in toxicology at the University of Leeds and medical officer of health for Leighton Buzzard. Receiving his medical education at University College, London, he qualified M.R.C.S., L.R.C.P., in 1893, and in the same year graduated M.B. with honours at the University of London. He took his M.D. in 1895, and obtained the Diploma in Public Health at Cambridge in 1897. He was a Barrister-at-Law of the Middle Temple.

ROYAL MEDICAL BENEVOLENT FUND.

THE annual report for 1920 of the committee of management of the Royal Medical Benevolent Fund opens with the statement that the diminished purchasing power of money makes it essential that the average amount of the grants, which at present is quite inadequate, should be considerably increased. New subscribers, it is pointed out, are best obtained by a personal canvass, and those interested in the Fund are urged to make its wants more widely known throughout the profession. The total amount received in donations and subscriptions was £3395 4*s.* 7*d.*, as compared with £2865 3*s.* 10*d.* in the preceding year. The total distributed in grants during the year, including Christmas gifts of 30*s.* to the more urgent cases, was £2768 14*s.* 1*d.*, of which £246 9*s.* was provided from the dinner fund account. The total granted the previous year was £2532 1*s.* Grants were made to 219 cases, and if it were possible to increase the income by £1000 a year it would, with the assistance of the dinner fund, which is kept for special cases and emergencies, be possible to raise the average of the grants by £6. The amounts distributed in annuities during the year totalled £4021 1*s.* 10*d.*, as against £3897 9*s.* 5*d.* in the previous year. The annuitants (who must be over 60 years of age) numbered 178; in December, 1920, it was agreed to increase the amount of 38 of the pensions from £20 to £26.

The Royal Benevolent Medical Fund Guild, which raises subscriptions for the provision of clothes, invalid comforts, and holidays for those who are assisted by the Fund, and also helps in the education of children, is rapidly developing, and the personal interest taken by its members in the applicants is a very valuable form of work. The War Emergency Fund received in January, 1921, a grant of £10,000 from the Committee of the National Relief Fund, to be expended for the benefit of those members of the profession who held commissions and had suffered financial loss in consequence of military service. Grants to the amount of £5926 17*s.* 6*d.* were made for this purpose. During the next few years the assistance of young people in the matter of training for a profession will be carried out on a more extensive scale. The committee have already agreed to bear the cost of the education of 25 boys and girls at public schools, and they would welcome applications for such purpose on behalf of any who are eligible for help from the Fund. The expenses of administration, which show a small increase due to the enhanced cost of clerical assistance, of postage, and printing, amount to less than 9 per cent.

MEDICAL REGISTER: UNTRACEABLE PRACTITIONERS.

WE are requested by the Registrar of the General Medical Council to give publicity to the following list of medical practitioners who have not replied to his inquiries as to the accuracy of their addresses. The list includes all untraceable names on the colonial and foreign lists, but only those from P to Z on the body of the register, as it is only this section which has come under review this year. Anyone who finds his or her name included in this list should communicate immediately with the Registrar (E) of the General Medical Council, 44, Hallam-street, Portland-place, London, W. 1.: or (S) of the Scottish Branch Council, 20, Queen-street, Edinburgh; or (I) of the Irish Branch Council, 35, Dawson-street, Dublin.

Packard, Henry C., M.B., Ch.B. 1895 (E).
Paget, Peter, M.R.C.S. 1889 (E).
Palmer, Henry D., M.R.C.S. 1870 (E).
Panioty, John E., L.R.C.P. 1882 (S).
Parbury, Frederic D., M.R.C.S. 1902 (E).
Parkinson, Charles J., M.R.C.S. 1882 (E).
Parkinson, Kathleen H., M.R.C.S. 1915 (E).
Parry, Robert C., M.R.C.S. 1913 (E).
Parsons, Charles, M.R.C.S. 1858 (E).
Parsons, Irene G., M.R.C.S. 1918 (E).
Patel, Edalji D., L.K.Q.C.P. 1881 (I).
Paterson, Alexander, M.B. 1866 (S).
Paterson, Andrew G., L.R.C.P. 1877 (S).
Paterson, Arthur T., M.B., Ch.B. 1907 (S).
Paton, Kate K., L.R.C.P. 1893 (S).
Pattee, Frank J., L.R.C.P. 1901 (S).
Patterson, George H., L.S.A. 1878 (E).
Pattie, Charles F., M.B. 1907 (S).
Paul, David R., L.R.C.P. 1883 (S).
Paul, George W. F., M.R.C.S. 1885 (E).
Pauling, William T., M.R.C.S. 1892 (E).
Pauw, Jacobus C., M.R.C.S. 1919 (E).
Payne, Florence M., L.S.A. 1902 (E).
Peacock, Edward V., M.B. 1893 (E).
Peake, Sydney J., M.R.C.S. 1900 (E).
Pearse, Robert R., L.S.A. 1889 (E).
Pearse, William H., M.R.C.S. 1897 (E).
Pearson, David C., M.B., B.Ch. 1904 (I).
Pearson, John C., M.B. 1875 (E).
Peirce, James E., L.S.A. 1868 (E).
Peirce, Thomas D., M.R.C.S. 1857 (E).
Pellissier, Wilfred V., M.B., B.Ch. 1917 (I).
Pemberton, Charles A., M.R.C.S. 1907(E).
Penberthy, Clifford P., M.B., Ch.B. 1916 (S).
Percival, Arthur P., M.B., C.M., 1894 (S).
Pereira-Marques, Laurence, L.R.C.S. 1877 (I).
Perkins, Matthew J., L.R.C.P. 1903 (S).
Perlman, Archie, M.R.C.S. 1910 (E).
Petty, Michael John, L.R.C.P. 1885 (E).
Peyton, Henry R., L.R.C.S. 1881 (I).
Phillipson, Burton R., L., L.M.R.C.P. 1897 (I).
Pick, Arthur, M.R.C.S. 1903 (E).
Pickett, Jacob, M.R.C.S. 1858 (E).
Piel, Paul A., L.R.C.S. 1884 (I).
Pillay, John J., L.R.C.P. 1891 (E).
Pink, Thomas, L.S.A. 1873 (E).
Plant, Alexander W., L.S.A. 1886 (E).
Platt, Akkey B., M.B., Ch.B. 1917 (E).
Pochin, Courtenay H. G., L.R.C.P. 1913 (E).
Pollock, John Hackett, M.B., B.Ch. 1913 (I).
Potter, Harry, M.R.C.S. 1883 (E).
Potter, Mary E., M.B., Ch.B. 1901 (S).
Powell, Henry A., L.R.C.P. 1880 (E).
Powell, Joseph H., L.R.C.P. 1883 (E).
Power, John E., M.B., Ch.B. 1914 (I).
Power, John W., L.K.Q.C.P. 1886 (I).
Power, John W., M.B., Ch.M. 1904 (E).
Power, Patrick J., L.R.C.S. 1886 (I).
Preston, Arthur B., M.R.C.S. 1914 (E).
Preston, Charles E., L.R.C.P. 1906 (S).
Price, Lloyd T., M.B., Ch.B. 1901 (S).
Price, Maurice D., L.R.C.P. 1907 (E).
Priddle, Alfred E., L.R.C.P. 1899 (E).
Prior, Norman H., *M.C.*, M.B., Ch.B. 1907 (S).
Proctor, Samuel P. P., M.B., Ch.B. 1910 (S).
Propert, Walter A., L.R.C.P. 1894 (E).
Pugh, Robert, M.B., Ch.B. 1898 (S).
Purdy, John S., *D.S.O.*, M.B., C.M. 1898 (S).
Purkis, Kenneth N., *M.C.*, M.R.C.S. 1915 (E).
Pushong, Edwin S., L.S.A. 1899 (E).
Puttana, Dodballapur S., L.R.C.P. 1912 (S).

Quicke, William J., L.S.A. 1876 (E).
Quinlan, Catharine J., M.B., B.Ch. 1914 (I).
Quirk, Francis P., L.R.C.P. 1911 (S).

Raine, Arthur R., L.S.A. 1879 (E).
Raine, George R., M.R.C.S. 1866 (E).
Raitt, Oswald, M.B., C.M., 1896 (S).
Ralston, Frederick G., M.B., Ch.B. 1899 (S).
Ralston, Robert G., M.B., C.M. 1896 (S).
Ranking, George L., L.R.C.P. 1907 (E).
Rao, Koty V. R., M.R.C.S. 1913 (E).
Rao, Srinivas Ram, L.A.H. 1912 (I).
Rasul, Sheikh G., L.R.C.P. 1912 (I).
Raubenheimer, Jan A., M.B., Ch.B. 1902 (S).
Raymond, Cuthbert, L.R.C.P. 1909 (E).
Rayner, Clifford G. J., M.R.C.S. 1918 (E).
Redahan, Thomas, L., L.M.R.C.P. 1893 (I).
Reddie, John O., M.B., C.M. 1884 (S).
Rees, David R., L.R.C.P. 1902 (S).
Rees, Rice, L.S.A. 1902 (E).
Regan, Edward, L.R.C.P. 1898 (S).
Reid, Alexander W., M.B. 1894 (S).
Reid, John, M.B. 1899 (S).
Relton, Charles D., M.B. 1905 (E).
Rendle, George, M.R.C.S. 1865 (E).
Rennie, Dennis C., M.R.C.S. 1918 (E).
Retallack, Cyrus, L.R.C.P. 1896 (S).
Reynolds, Leonard G., M.R.C.S. 1897 (E).
Richards, David H., L.R.C.P. 1905 (E).
Richards, John F. G., *D.S.O.*, M.B., B.S., 1912 (E).
Richardson, Alfred G., M.B., C.M. 1882 (E).
Richardson, Cyril B., L.A.H. 1914 (E).
Richardson, Ernest D., L.M.S.S.A. 1910 (E).
Richardson, Sidney L., M.R.C.S. 1876 (E)
Riches, Reginald G., M.R.C.S. 1909 (E).
Riddle, Hugh H., M.B., B.C. 1901 (E).
Ridpath, David, M.D. 1865 (S).
Ridsdale, Arthur E., M.R.C.S. 1894 (E).
Rigby, Percy A., L.S.A. 1882 (E).
Rimer, Franklin E., L.S.A. 1896 (E).
Robb, Elizabeth M., M.B., B.Ch. 1914 (I).
Roberts, Annie C., M.B., Ch.B. 1918 (S).
Roberts, Edwin, M.R.C.S. 1884 (E).
Roberts, Henry W., L.S.A. 1876 (E).
Roberts, Sidney M. P., M.R.C.S. 1884 (E).
Roberts, Thomas H. F., M.R.C.S. 1904 (E).
Robertson, Edward B., M.B., C.M. 1872 (S).
Robertson, Francis D., L.R.C.P. 1886 (E).
Robertson, George O., M.B., Ch.B. 1902 (S).
Robertson, John William, L.S.A. 1899(E).
Robertson, Michael W., M.B., Ch.B. 1901 (S).
Robertson, Thomas M., M.B., C.M. 1883 (S).
Robertson, William G., M.R.C.S. 1905(E).
Robins, Henry, L.R.C.P. 1892 (E).
Robinson, Charles B., L.R.C.P. 1911 (S).
Robinson, Douglas A., L.R.C.P. 1896 (S).
Robinson, George, M.R.C.S. 1861 (E).
Robinson, George C., L., L.M.R.C.P. 1902 (I).
Robinson, Harry W., M.B., C.M. 1886 (S).
Robinson, Haynes S., M.R.C.S. 1861 (E).
Robinson, Henry, L.K.Q.C.P. 1883 (E).
Robinson, Samuel, L.M.S.S.A. 1918 (E).
Robinson, Wilford V., M.R.C.S. 1881 (E).
Roche, Augustine K., M.B., B.Ch. 1914 (I).
Rochfort-Brown, Herbert, M.R.C.S. 1891 (E).
Rodman, George H., M.B. 1883 (E).
Rodrigues, Jose S. Da P., L.R.C.P. 1901 (E).
Rogers, William H., L.F.P.S. 1862 (I).
Rolston, George T., L.R.C.S. 1856 (E).
Roome, Henry A., M.B., C.M. 1878 (S).
Rooney, Patrick J., L., L.M.R.C.P. 1906 (I).
Rosair, Harry B., L.A.H. 1911 (I).
Rosario, Leonard G. de, L.R.C.S. 1902 (I).
Rose, Daniel A., L.R.C.P. 1891 (S).
Ross, Chisholm, M.B., C.M. 1883 (S).
Ross, Donald M., L.R.C.P. 1903 (E).
Ross, William G., M.R.C.S. 1872 (E).
Rosser, John S., M.B. 1887 (S).
Row, Tandalam M., L.R.C.P. 1906 (E).
Rowland, Edward R., M.R.C.S. 1869 (E).
Rowland, Henry A., M.B., C.M. 1892 (S).
Roy, Paresh R., L.R.C.P. 1899 (S).
Roy, Shushil K., M.B. 1901 (S).
Rukhmabai, L.R.C.P. 1894 (E).
Rupp, Karl, L.R.C.P. 1908 (E).
Russell, Robert H., M.R.C.S. 1882 (E).
Russell, Wilfred A., M.R.C.S. 1911 (E).
Russell, William, *M.C.*, M.B., Ch.B. 1915 (I).
Russell, William F., L.R.C.P. 1910 (I).
Rutherfoord, Henry T., M.D. 1885 (E).
Ryan, James D., L.R.C.S. 1882 (I).
Ryan, John M., M.B., B.Ch. 1915 (I).
Ryan, John R., M.D. 1891 (I).
Ryan, Michael, L.R.C.P. 1893 (S).
Ryde, Cyril A., L.S.A. 1891 (E).
Rygate, Arthur M., L.R.C.P. 1897 (E).

Saint-Cedd, Reginald G. W., L.S.A. 1899 (E).
Samarasinha, Len P., L.R.C.P. 1917 (S)
Sampson, Arthur T., M.B., C.M. 1896 (S).
Samut, Richard P., L.S.A. 1882 (E).
Sanderson, Arthur F., L.R.C.P. 1909 (E).
Sandison, John F. W., *O.B.E.*, *M.C.*, M.B., Ch.B. 1914 (S).
Sansom, Eric A. L., M.R.C.S. 1914 (E).
Saunders, William H. P., L.R.C.P. 1913 (E).
Savage, John J., L.R.C.P. 1917 (E).
Sawdon, James E., M.R.C.S. 1908 (E).
Sayer, Ettie, M.B., B.S. 1899 (E).
Schuster, Norah H., M.B., Ch.B. 1918 (E).
Schwarz, Emil, M.R.C.S. 1905 (E).
Scott, Alexander, M.B., Ch.B. 1907 (S).
Scott, Charles F. T., M.B., Ch.B. 1907 (S).
Scott, David A. E., M.B., B.Ch. 1918 (I).
Scott, Frank R., L.R.C.P. 1912 (S).
Scully, Albert McC., M.D. 1880 (I).
Seah, Eng S., M.B., Ch.B. 1916 (S).
Sellers, Muriel, M.B., Ch.B. 1919 (S).
Semple, William H., M.D. 1864 (S).
Sessions, Frederick L., L.R.C.P. 1897 (E).
Sexton, Henry W., M.R.C.S. 1902 (E).
Shafeek, Ahmad, M.R.C.S. 1911 (E).
Sharman, Edward W., L.R.C.P. 1891 (S).
Sharpe, George M., L.A.H. 1900 (E).
Shaw, John C., M.R.C.S. 1888 (E).
Shaw, John P., *M.C.*, M.R.C.S. 1914 (E).
Shaw, Robert W., M.R.C.S. 1900 (E).
Shearer, Ella S. (Mrs.), M.B. 1907 (S).
Sheedy, Michael M., L.R.C.P. 1869 (I).
Sheedy, Thomas, L.R.C.S. 1878 (E).
Sheehan, Michael, M.R.C.S. 1900 (I).
Shelmerdine, Joseph C., L.R.C.P. 1902(S).
Shelton-Jones, Ernest, M.R.C.S. 1901 (E).
Shepherd, Charles D., M.R.C.S. 1862 (E).
Shipsey, William E., L.R.C.P. 1919 (I).
Shirgaokar, Shantaram R., M.B. 1907 (E).
Shirtliff, Edward D., L.S.A. 1888 (E).
Shore, Richard A. A., M.R.C.S. 1901 (E).
Sibree, Alice D. (Miss), L.R.C.S. 1901 (E).
Sieff, Basja (Miss), L.R.C.P. 1912 (I).
Silbermann, Alexander, L.A.H. 1907 (E).
Silver, Louis M., M.B. 1889 (S).
Simmonds, Ernest G., M.R.C.S. 1896 (E).
Simoens, Joseph A., L.R.C.P. 1884 (E).
Simon, John W., M.R.C.S. 1905 (E).
Simons, Charles N., L.S.A. 1881 (E).
Simpson, George A., L.S.A. 1896 (E).
Simpson, John C., M.B. 1910 (S).
Simpson, William H., M.B. 1903 (S).
Simpson, William S., M.R.C.S. 1909 (E).
Sinclair, Alexander H., M.B. 1911 (S).
Sinclair, Henry, M.D. 1881 (E).
Singer, Kildare L., M.R.C.S. 1917 (E).
Singh, Bakhshi K., M.B. 1912 (E).
Singh, Baldev, L.R.C.P. 1908 (E).
Singh, Sunder, L.S.A. 1907 (E).
Singh, Tehl, M.B. 1911 (E).
Sircar, Jyotiprokas, M.B. 1913 (S).
Sisk, Maurice, M.B. 1894 (I).
Skae, Frederick M. T., M.B. 1890 (S).
Skene, Charlotte G. (Mrs.), M.B. 1913 (E).
Skinner, John D., M.B. 1909 (S).
Skinner, William B., *D.S.O.*, M.B. 1887 (E).
Slack, George F., M.R.C.S. 1871 (E).
Sloman, Arthur E., M.B. 1887 (S).
Smit, Hendrik C. van der Wat, M.B. 1912 (S).
Smith, Alexander C., M.B. 1893 (S).
Smith, Alfred P., M.B. 1914 (E).
Smith, Ernest B., M.B. 1879 (E).
Smith, (Mrs.) Frances A. D. M., M.B. 1899 (I).
Smith, George Pender, L.S.A. 1892 (E).
Smith, Graham, L.R.C.S. 1907 (E).
Smith, Herbert, M.R.C.S. 1881 (E).
Smith, Janet S., M.B. 1918 (S).
Smith, Louise B., L.R.C.P. 1896 (S).
Smith, Philip D., M.B. 1894 (S).

Smith, Robert G., M.B. 1874 (E).
Smith, Sydney H., M.B. 1895 (S).
Smithwick, Gerald W., L.R.C.P. 1901 (S).
Smyly, Henry J., M.B. 1911 (I).
Smyth, Andrew, L.R.C.P. 1902 (S).
Smyth, Thomas, M.B. 1912 (I).
Soderstrom, Erik D., M.B. 1916 (S).
Sodhi, Baba M. S., M.B. 1902 (E).
Somerville, John, M.B. 1888 (S).
Souter, John F., M.B. 1889 (E).
South, Frederick W. B., L.S.A. 1886 (E).
Southam, John B., M.R.C.S. 1868 (E).
Spelman, Andrew P., M.B. 1916 (I).
Spencer-Daniell, John, M.B. 1906 (S).
Spring, Douglas N., M.B. 1909 (S).
Sproule, Robert, M.B. 1902 (S).
Stack, Catherine F. M., L.R.C.P. 1901 (S).
Stacpoole, Adam R., L.R.C.S. 1883 (E).
Stainer, Edward, M.B. 1897 (E).
Stals, Albert J., M.D. 1909 (I).
Stead, Dryden, M.R.C.S. 1892 (E).
Steele, Edward E., L.R.C.S. 1913 (E).
Steggall, Septimus L. J., M.R.C.S. 1892 (E).
Stegman, Daniel A., L.R.C.P. 1919 (S).
Steven, Arthur R., M.B. 1916 (S).
Stewart, Andrew, M.B. 1900 (S).
Stewart, Charles H., L.S.A. 1893 (E).
Stewart, Charles J., M.R.C.S. 1914 (E).
Stewart, Charles R., *O.B.E.*, M.B. 1902 (E).
Stewart, Edward E., M.B. 1910 (S).
Stewart, Margaret A. H., M.B. 1916 (S).
Stewart, Roger P., M.B. 1912 (E).
Stewart, William A., M.R.C.S. 1913 (E).
Stewart, William J., M.B. 1913 (I).
Stirling, Robert A., L.R.C.P. 1881 (E).
Stock, William S. V., M.R.C.S. 1898 (E).
Stockwell, George E. St. C., B.C. 1902 (E).
Stodart, David E., M.B. 1910 (E).
Stogdon, Mildred B., M.R.C.S. 1913 (E).
Stone, John William, L.S.A. 1886 (E).
Stones, Thomas, L.R.C.P. 1871 (E).
Stoney, William W., M.B. 1893 (E).
Storey, Thomas C., *M.C.*, M.B. 1912 (E).
Strange, Arthur, M.R.C.S. 1892 (E).
Stringer, Louis B., M.R.C.S. 1912 (E).
Strong, Robert G., L.R.C.P. 1880 (E).
Stubbs, Edward J., L.R.C.P. 1906 (S).
Studdert, John M., L.R.C.P. 1876 (I).
Sturgis-White, Russell, M.B. 1890 (E).
Stutt, Albert E., L.R.C.P. 1881 (S).
Suares, Jerome, L.R.C.S. 1914 (I).
Sutcliff, Joseph H., M.R.C.S. 1854 (E).
Sutcliffe, Edward, M.R.C.S. 1907 (E).
Sutton, William H. R., B.C. 1907 (E).
Swanseger, Percy C. B., L.R.C.P. 1895 (S).
Sykes, Lilian E., L.R.C.S. 1897 (E).
Symons, Herman B. T., L.S.A. 1891 (E).
Syree, Anton H., M.R.C.S. 1883 (E).

Taaffe, John F. H., L.S.A. 1883 (E).
Taaffe, Oliver G., L.R.C.P. 1884 (E).
Tabb, John F., M.R.C.S. 1879 (E).
Tahmisian, Paul B., M.R.C.S. 1896 (E).
Takaki, Kanehiro (Baron), L.R.C.P. 1878 (E).
Takaki, Kenji, M.R.C.S. 1904 (E).
Takaki, Yoshihiro, M.R.C.S. 1899 (E).
Tannahill, Thomas F., M.B. 1880 (S).
Tarrant, Hugh S., M.B. 1900 (I).
Tayler, William G., M.R.C.S. 1861 (E).
Taylor, Adrian H., L.R.C.P. 1873 (I).
Taylor, Alexander J. R., M.B. 1915 (S).
Taylor, David S., L.R.C.P. 1916 (E).
Taylor, Edward H., M.B. 1890 (I).
Taylor, Emma (Mrs.), L.R.C.P. 1902 (S).
Taylor, Hugh W. Y., M.B. 1919 (S).
Taylor, Rogers W. G., M.B. 1877 (I).
Taylor, William, L.R.C.P. 1909 (S).
Taylor, William A. O., M.B. 1906 (E).
Teasdall, Walter J., L.S.A. 1886 (E).
Teeger, Bernard, M.B. 1911 (I).
Teichelmann, Ebenezer, L.K.Q.C.P. 1887 (E).
Telfer, Charles, M.B. 1895 (E).
Tellet, Frederick S., L.R.C.S. 1869 (I).
Tempest, James, M.R.C.S. 1897 (E).
Tennekoon, John P. R., M.R.C.S. 1917 (E).
Thacker-Neville, William S., M.B. 1908 (I).
Thayer, Linns O., L.S.A. 1875 (E).
Thistle, William B., L.R.C.P. 1887 (E).
Thom, George, L.R.C.P. 1905 (E).
Thomas, David J., M.R.C.S. 1880 (E).
Thomas, Harold S., M.R.C.S. 1908 (E).
Thomas, Walter R., L.S.A. 1891 (E).
Thompson, Charles E., L.K.Q.C.P. 1886 (I).
Thompson, John, M.R.C.S. 1859 (E).
Thompson, Samuel G., L.R.C.P. 1882 (S).
Thomson, Malcolm E., L.R.C.S. 1884 (E).
Thomson, Thomas, L.S.A. 1880 (E).
Thornton, Philip, L.S.A. 1870 (E).
Tilleke, William G., M.R.C.S. 1919 (E).
Tilling, Harold W., M.R.C.S. 1910 (E).
Tindale, Wentworth R., M.R.C.S. 1866 (E).
Tizard, Henry J., M.R.C.S. 1890 (E).
To, Ying K., M.B. 1917 (S).
Tobit, Perry P., L.S.A. 1902 (E).
Tomlinson, William R., L.R.C.S. 1883 (I).
Toombs, Herbert G., M.R.C.S. 1894 (E).
Tooth, Frederick, M.R.C.S. 1914 (E).
Torley, John Lawrence, M.B. 1916 (S).
Tothill, Alfred R., M.R.C.S. 1918 (E).
Trail, Alexander F., M.B. 1874 (S).
Traill, Ralph R., M.R.C.S. 1916 (E).
Tren, Herman, M.B. 1915 (S).
Trenow, Nigel A. A., L.S.A. 1890 (E).
Truman, Charles E., M.R.C.S. 1875 (E).
Turner, Charles, M.R.C.S. 1853 (E).
Twidale, Frederick W., M.B. 1896 (E).
Tyndall, John, L.R.C.S. 1866 (I).
Tyrrell, James H., L.R.C.P. 1874 (S).

Usher, Victor F., M.B. 1907 (S).
Uttley, William W., M.R.C.S. 1909 (E).

Vaillant, Marie E., L.R.C.P. 1900 (S).
Van der Merwe, Cornelius J., M.B. 1917 (S).
Vaughan, James C., M.B. 1918 (S).
Venn, Albert J., M.B. 1873 (E).
Venugopal, Sadanala B., M.R.C.S. 1914 (E).
Vertannes, Carr A., M.R.C.S. 1896 (E).
Vickers, William H. P., M.B. 1890 (I).
Vigne, Alfred, M.B. 1890 (I).
Vijver, Gifford T. van der, *M.C.*, M.B. 1914 (S).
Violette, William B., M.B. 1881 (E).
Visser, Andries G., M.B. 1906 (S).
Voisin, Alexander B., M.R.C.S. 1881 (E).
Von Himpe, Emilie T. V., L.S.A. 1895 (E).
Von Mengershausen, Hubert M., M.B. 1915 (E).
Von Wyss, Walter H., M.R.C.S. 1913 (E).

Wace, Cyril, M.R.C.S. 1983 (E).
Wace, Richard H., M.B. 1894 (E).
Wacher, Geoffrey, M.R.C.S. 1906 (E).
Waddell, Alexander G., M.B. 1911 (S).
Waddell, Laurence A., M.B. 1878 (S).
Waddell, Sydney, M.B. 1900 (I).
Wahby, Behdjet, M.R.C.S. 1907 (E).
Walker, Alexander, M.B. 1876 (S).
Walker, Ernest F. D., M.B. 1896 (S).
Walker, James D., M.B. 1891 (S).
Walker, John, M.R.C.S. 1902 (E).
Walker, Margaret, M.B. 1915 (S).
Walker, Robert W. S., M.R.C.S. 1907 (E).
Walker, Thomas M., M.R.C.S. 1899 (E).
Walker, Walter W., M.B. 1892 (E).
Wall, Arthur P., M.B. 1906 (S).
Wall, Hon. Frank E., M.B. 1907 (S).
Wall, James M., L.M.S.S.A. 1916 (E).
Wall, Kathleen G., L.R.C.P. 1913 (I).
Wallace, Robert F. S., M.R.C.S. 1893 (E).
Wallace, Thomas, M.B. 1918 (I).
Waller, John, M.R.C.S. 1866 (E).
Walsh, Edward, M.B. 1916 (I).
Walsh, John H., L.R.C.S. 1895 (I).
Walsh, John Joseph, L.R.C.S. 1888 (I).
Walsh, Richard F., M.B. 1916 (I).
Ward, Oswald E., M.R.C.S. 1900 (E).
Ward, Sidney H., M.R.C.S. 1909 (E).
Wareham, Harold E., M.B. 1901 (S).
Watermayer, Herbert A., M.R.C.S. 1913 (E).
Watkins, William L., L.R.C.S. 1866 (I).
Watson, Charles H., *O.B.E.*, M.B. 1899 (S).
Watson, Isabella A., L.R.C.P. 1900 (S).
Watson, John, M.B. 1887 (E).
Watson, Samuel E., M.B. 1911 (I).
Watson, Thomas A., M.B. 1884 (S).
Watson, William S., M.B. 1908 (S).
Watt, Alexander, M.B. 1902 (S).
Watt, James, M.B. 1895 (S).
Watt, William W. W., L.R.C.P. 1912 (S).
Watts, Adeline M., L.R.C.P. 1908 (S).
Watts, Rattan C., M.B. 1917 (E).
Waugh, Robert James, M.R.C.S. 1902 (E).
Way, Frederick W., M.R.C.S. 1856 (E).
Webb, Hermann W., M.B. 1911 (S).
Webster, Frederic L., M.R.C.S. 1915 (E).
Webster, George A., M.R.C.S. 1886 (E).
Webster, Joseph H., L.R.C.P. 1872 (E).
Weddick, John, L.R.C.P. 1874 (I).
Weinman, Leonard O., L.R.C.P. 1914 (S).
Weir, Crosbie, L.Med.L.S. 1916 (I).
Welch, Frederick D., M.R.C.S. 1901 (E).
Weld, James C., L.R.C.P. & S. 1872 (I).
Welsby, Claude B., L.M.S.S.A. 1912 (E).
Welsh, William K. B., M.R.C.S. 1872 (E).
Wessels, Cornelius A., M.R.C.S. 1899 (E).
Westcott, William W., M.R.C.S. 1870 (E).
Wheat, Ernest G., M.R.C.S. 1908 (E).
Wheatley, Thomas D., M.R.C.S. 1851 (E).
Wheeler, Percy C. E. D'Erf, M.R.C.S. 1885 (E).
Wheeler, William A., M.D., 1889 (I).
Whish, George M., M.B. 1912 (S).
Whitaker, Roy H. R., M.R.C.S. 1901 (E).
White, Edmund L., M.B. 1914 (S).
White, Edward B. C., M.R.C.S. 1908 (E).
White, Michael, M.D. 1873 (I).
White, Walter W., L.R.C.P. 1886 (E).
Whitehead, Alfred, M.R.C.S. 1871 (E).
Whitehead, Jerry, M.B. 1909 (E).
Whitelaw, John, M.B. 1919 (S).
Whiteley, George W., M.R.C.S. 1879 (E).
Whitford, William, M.D. 1878 (E).
Whitney, Willis N., M.D. 1881 (E).
Wickham, George W., L.R.C.P. 1892 (E).
Wicks, Frederick, M.R.C.S. 1870 (E).
Wigmore, Arthur W., L.R.C.P. 1887 (E).
Wilcock, Arthur G. E., L.M.S.S.A. 1916 (E).
Wilkin, Richard McK., L.R.C.P. 1900 (I).
Wilkins, John C., M.R.C.S. 1865 (E).
Wilkinson, John H., M.R.C.S. 1911 (E).
Williams, Arthur J., L.R.C.P. 1895 (S).
Williams, David E., L.R.C.P. 1892 (I).
Williams, David P., M.R.C.S. 1909 (E).
Williams, Edward J., L.R.C.S. 1886 (I).
Williams, Gomer, M.B. 1913 (S).
Williams, Howell M., M.R.C.S. 1908 (E).
Williams, James A., M.B. 1915 (S).
Williams, James T., M.B. 1897 (S).
Williams, John E., M.R.C.S. 1890 (E).
Williams, Josiah, L.R.C.S. 1878 (E).
Williams, Neville, M.R.C.S. 1875 (E).
Williamson, Gladys R. M. V., M.B. 1916 (S).
Williamson, Wilson T., M.R.C.S. 1906 (E).
Willmore, James G., M.R.C.S. 1906 (E).
Wilson, Colin, M.B. 1914 (E).
Wilson, Frederic E., M.B. 1901 (S).
Wilson, Geoffrey P., M.R.C.S. 1902 (E).
Wilson, Gwendolen J. E., M.B. 1918 (S).
Wilson, Harry M., B.C. 1904 (E).
Wilson, James A. K., L.R.C.P. 1887 (S).
Wilson, John H., L.S.A. 1898 (E).
Wilson, John S., M.R.C.S. 1873 (E).
Wilson, Robert Archibald, M.D. 1873 (S).
Wilson, Thomas, L.S.A. 1882 (E).
Wilson, Thomas, M.B. 1902 (E).
Wilson, William J., M.B. 1898 (I).
Wilson, William T., M.R.C.S. 1873 (E).
Windsor-Aubrey, Henry W., M.R.C.S. 1885 (E).
Wiseman, John G., M.R.C.S. 1867 (E).
Wolfe, Robert I., L.S.A. 1887 (E).
Wollaston, Alexander F. R., M.R.C.S. 1903 (E).
Woo, Arthur W., M.R.C.S. 1913 (E).
Woo (Ng) Tin P., M.B. 1915 (E).
Wood, Francis H., L.R.C.P. 1876 (S).
Wood, George E. C., M.B. 1885 (S).
Wood, William B. H., M.R.C.S. 1897 (E).
Woods, Eric A., M.R.C.S. 1918 (E).
Woods, Francis H., M.R.C.S. 1859 (E).
Woods, John R. L., M.R.C.S. 1902 (E).
Woods, Leonard H., M.R.C.S. 1917 (E).
Woodward, Ernest A., M.B. 1888 (S).
Woodward, Martin, M.R.C.S. 1858 (E).
Woodward, William, M.R.C.S. 1887 (E).
Woolf, Montague S., M.R.C.S. 1914 (E).
Woollard, Charles, M.R.C.S. 1910 (E).
Woolmer, Shirley L., L.S.A. 1884 (E).
Wordsworth, William J., M.R.C.S. 1886 (E).
Woudberg, Peter C., M.B. 1914 (S).
Wreford, John, M.R.C.S. 1887 (E).
Wright, George, L.R.C.P. 1890 (S).
Wright, John W., L.R.C.P. 1879 (E).
Wright, Martensz J., M.B. 1882 (S).
Wright, Thomas N., L.R.C.P. & S. 1884 (I).
Wright, Walter S., L.S.A. 1891 (E).
Wrigley, Frederick H., L.A.H. 1876 (E).
Wyer, John F. W., M.R.C.S. 1914 (E).

Yates, George D., M.B. 1914 (S).
Young, Andrew, L.R.C.P. 1902 (S).
Young, Ernest W. G., *O.B.E.*, *M.C.*, M.B. 1910 (E).
Young, Francis B., M.B. 1906 (E).
Younger, Isabella H., M.B. 1914 (S).

COLONIAL LIST.

Ainley, William E., M.D. 1904.
Allison, Gerald, M.B. 1915.
Ardill, Katie, M.B. 1913.
Armitage, Charles H., M.B. 1915.

Baillie, Samuel A., M.D. 1902.
Ball, Stanley S., M.B. 1915.
Balsara, Maneckji N., L.M.S. 1906.
Banker, Shiavux S., L.R.C.P. 1912.
Barton, Oswald, M.B. 1914.
Bastedo, Albert F., M.B. 1914.
Beaton, John, M.D. 1912.
Beaton, Wesley G., M.D. 1919.
Bernard, Samuel D., L.M.S.N. Scotia, P.M. Bd. 1917.
Bhat, Sadashiv V., L.M.S. 1910.
Bhivandivala, Peshotan D., L.M.S. 1910.

Birch, John B., M.B. 1915.
Birnie, George A., *M.C.*, M.B. 1914.
Blair, James H., M.B. 1916.
Blakeley, Thomas N., M.D. 1915.
Bobart, Albert, M.B. 1889.
Boulton, Nigel P., M.B. 1912.
Bradley, Clement H. B., M.B. 1907.
Brandon, John V., M.D. 1915.
Brown, Edmund E., M.B. 1910.
Brown, John Ebenezer K., M.B. 1912.
Buchanan, James H., M.D. 1914.
Burden, Frederick W., L.M.S. Nfd. M. Bd. 1914.
Burke, Michael C., M.D. 1915.
Burns, Harold S., M.B. 1907.
Burrows, Frederick L., M.D. 1914.

Cameron, Wyman A., L.M.S. N. Scotia, P.M. Bd. 1915.
Camilleri, Victor, M.D. 1913.
Campbell, Edgar A., M.D. 1916.
Canteenvalla, Jehangir P., L.M.S. 1913.
Chak, Chin H., M.B. 1914.
Champion de Crespigny, Constantine T., M.B. 1903.
Chattopadhya, Shyama P., L.M.S. 1909.
Cohen, Benjamin, M.B. 1918.
Cohen, Rachel, M.B. 1897.
Colquhoun, Keith G., M.B. 1909.
Commissariat, Sherin H. (Miss), F.R.C.S. 1904.
Cotton, George R. C. M.B. 1907.
Coutts, Eldon D., M.B. 1915.
Croom, Stuart P., M.B. 1909.

Daniel, Charles J., M.B. 1909.
Dark, Eric P., *M.C.*, M.B. 1914.
Da Silva, Augustin P., L.M.S. N. Scotia, P.M. Bd. 1919.
David, William E., *M.C.*, M.B. 1913.
De, Rai B. C. M., L.M.S. 1895.
De Beaupre, E. J., M.B. 1915.
Dew, Harold Robert, M.B. 1914.
D'Mello, John F., L.M.S. 1899.
Dolman, Henry, M.B. 1916.
Donovan, Charles O. G., *D.S.O.*, M.B. 1915.
Douglas, Leon A., M.C.P. & S. 1910.
Dowd, William R., M.C.P. & S. 1918.
Dyas, Alexander D., L.M.S., N.B. Co. P. & S. 1913.

Eastwood, Francis H., M.B. 1881.
Edwards, William A., M.B. 1914.
Elliot, Hugh A., M.C.P. & S. 1916.
Ewing, Thomas, M.B. 1909.

Fairley, Neil H., M.B. 1915.
Farrar, John W., *O.B.E.*, M.B. 1914.
Ferguson, Norman H., M.C.P. & S. 1902.
Fetherstonhaugh, Trevor G., M.B. 1915.
Finlay, Donald F., M.B. 1914.
Flecker, Hugo, M.B. 1908.
Foster, Bryan, M.B. 1904.
Fowler, Cosmo W., M.B. 1913.

Gaina, Nariman J., M.B. 1912.
Gallagher, Michael J., M.B. 1913.
Giblin, William E., M.B. 1908.
Gibson, Harold R., M.B. 1916.
Ginsburg, Bernard J., M.D. 1917.
Godinho, Louis G., L.M.S. 1889.
Gower, George W., M.B. 1910.
Graham, Malcolm R., M.B. 1906.
Gregg, Norman Mc.A., M.B. 1915.
Gupta, Syama P., L.M.S. 1909.
Guymer, Arthur H., M.B. 1915.

Halloran, Garnet R., M.B. 1912.
Hamilton-Browne, Elizabeth I., M.B. 1909.
Hardstaff, Roy J., M.B. 1916.
Harris, William H., M.B. 1897.
Harvey, Francis R., M.B. 1910.
Haslett, Selwyn L., M.B. 1915.
Hesterlow, Alfred J., L.M.S. 1885.
Hingorani, Gianchand T., M.B. 1913.
Hodge, William R., M.B. 1915.
Hotop, Francis R., M.B. 1903.
Humphreys, Stanley E., M.B. 1914.
Hunter, Thomas V., L.M.S., N.B.Co.P. & S. 1906.
Hyett, Harold R., M.B. 1916.

Illesinghe, Richard De S., L.M.S. 1900.

Jagger, Thomas R., M.B. 1915.
Jamieson, James I. M., M.B. 1914.
Jenkins, James A., M.B. 1917.
Jhirad, Jerusha J. (Miss), L.M.S. 1913.
Jinadasa, M., L.M.S. 1895.
Jones, Edmund Britten, M.B. 1910.

Keane, Francis E., *M.C.*, M.B. 1910.
Kennedy, Basil C., M.B. 1913.
Krolik, Melville, L.M.S.N.Scotia P.M.Bd. 1915.

Lal, Kananji, L.M.S. 1898.
Lambert, Joseph G., M.D. 1914.
Langham, John D., M.D. 1916.
Lawrence, Arthur P., *M.C.*, M.B. 1916.
Leary, Edgar J., M.B. 1912.
Leonard, Elsie F. (Mrs.), M.B. 1908.
Lloyd, Charles H., *M.C.*, M.B. 1914.
Lobo, John F., L.M.S. 1910.

MacCallum, Arthur J., M.B. 1916.
McCarthy, Francis J., M.B. 1914.
McInnes, John S., M.D. 1916.
McIntyre, Edward L., M.B. 1911.
Mackasey, William P., M.D. 1914.
McKay, Daniel A., L.M.S.N. Scotia P.M.Bd. 1906.
MacLaren, Peter S., M.C.P. & S. 1896.
MacLean, Jean A., M.D. 1914.
MacLeod, Donald A., M.D. 1911.
McShane, Cletus, M.B. 1909.
Magarey, Archibald C., M.B. 1907.
Marshall, Thomas E., M.B. 1916.
Martin, Colin H., M.B. 1915.
Masters, Francis H., M.B. 1897.
Mendelsohn, Harris, *M.C.*, M.B. 1916.
Menezes, Laetitia L., L.M.S. 1908.
Middleton, John J., M.B. 1912.
Mitchell, Henry K., M.B. 1915.
Mody, Lovji S., L.M.S. 1908.
Mollison, Arthur J., M.B. 1912.
Moolan Feroze, Gehangir K., M.B. 1914.
Morgan, Edward A., M.B. 1909.
Morgan, Vincent H., M.D. 1887.
Mozoomda, Bidhan P., L.M.S. 1911.

Naylor, Arthur H., M.B. 1916.
Newell, John A., M.B. 1891.
Nixon, Albert C., M.C.P. & S. 1915.
Nye, Leslie J. J., M.B. 1914.

O'Dwyer, Patrick J., M.D. 1916.
Old, George G., M.B. 1900.
Ormiston, Martha I., M.B. 1907.
Orok, William F., M.C.P. & S. 1916.
Osborne, John K., M.B. 1903.
O'Shea, Joseph P., M.C.P. & S. 1911.

Padmanabhan, P., L.M.S. 1890.
Pant, Pitambar, L.M.S. 1906.
Paquin, Rene P., M.D. 1918.
Parker, Thomas E., M.B. 1910.
Patel, Khusroo K., L.M.S. 1912.
Paterson, Murray H., *M.C.*, M.B. 1914.
Pellew, Leonard J., M.B. 1906.
Petrie, George A., M.D. 1915.
Pilot, Frederick W. H., M.D. 1904.
Playford, Thomas G., *M.C.*, M.D. 1917.
Pogue, Osman A., M.B. 1908.
Postwalla, Rustam M., M.B. 1914.

Ray, William, M.B. 1906.
Roberts, Alan T., M.B. 1914.
Robinson, Matthew E., M.B. 1909.
Rommel, Ernest, M.C.P. & S. 1913.
Roseby, Edmund R., M.B. 1900.
Row, Narsing, M.B. 1909.
Roy, Raghu N., L.M.S. 1909.
Rutherford, Constance M., M.B. 1908.

Sa, Ma S., L.M.S. 1912.
Salter, Alexander G., M.B. 1895.
Sanzgiri, Vasant R., M.B. 1916.
Sapsford, Clinton P., M.B. 1905.
Saunders, John H., M.B. 1889.
Savory, Philip M. H., L.M.S. N. Scotia P.M.Bd. 1919.
Scott, Malcolm L., M.B. 1904.
Scribner, John F., M.D. 1911.
Seifert, Frederick W., M.D. 1905.
Sherwin, John A. H., M.B. 1908.
Sinclair, James W., M.B. 1918.
Sinha, Kamal K., M.B. 1918.
Sloane, John G. M., M.B. 1895.
Smith, Gerald K., M.B. 1908.
Smith, Harry R., M.B. 1915.
Smith, Hilton C. G., M.B. 1908.
Smith, William W., M.B. 1912.
Soares, Alexander D., M.B. 1918.
Stawell, Richard R., M.D. 1887.
Stephen, Edgar H. M., M.B. 1902.
Stephens, Frederick G. N., M.B. 1908.
Stewart, Floyd C., M.D. 1914.
Surti, Sorabji B., L.M.S. 1907.
Surveyor, Nusservanji F., L.M.S. 1890.
Sutherland, George R., M.D. 1897.
Sutton, George, M.B. 1904.

Tait, Henry C., *M.B.E.*, M.B. 1910.
Teoh, Cheng T., M.B. 1915.
Thakor, Manjulal J., L.M.S. 1907.
Thompson, Allen E., *D.S.O.*, *M.C.*, M.D. 1913.
Thomson, Jack M., M.B. 1903.
Thumboo, Adolphus J., L.M.S. 1910.
Tillekeratne, Charles J., L.M.S. 1895.

Uren, Cecil, M.B. 1915.

Vakil, Burjor P., M.B. 1919.
Verge, Arthur, M.B. 1905.
Verge, Cuthbert A., M.B. 1910.

Wadia, Sheriar R., M.B. 1916.
Waine, Jack G., M.B. 1914.
Wallace, Norman C., M.B. 1896.
Wark, David R., M.D. 1914.
Weld, Elizabeth E., M.B. 1901.
Wettenhall, Roland R., M.B. 1906.
Whelpley, Ernest H., M.D. 1916.
White, Samuel G., M.C.P. & S. 1913.
Whyte, John J., M.D. 1889.
Wilkin, James T. W., M.B. 1906.
Willcocks, George C., M.B. 1913.
Williams, Gerald S., M.D. 1913.
Williams, William E., L.M.S. M.Co., P.E.I. 1915.
Willoughby, John B., M.B. 1916.
Wilson, Ivan S., *M.C.*, M.B. 1907.
Writer, Jamsetji H., L.M.S. 1907.
Wyllie, Hugh A., M.B. 1915.

Young, Hugh M., M.C.P. & S. 1912.

FOREIGN LIST.

Abrassart, Maurice A., M.D. 1904.
Allo, Gustave, M.D. 1892.

Bury, Lucien N. J. J., M.D. 1901.
Bussens, Jules, M.D. 1908.

Cook, Edward, M.D. 1904.
Cools, Henri, M.D. 1899.
Crousse, Rene, M.D. 1912.

De Caestecker, Jules, M.D. 1913.
De Castro, Antonio, M.D. 1909.
Deckx, Henry M., M.D. 1899.
De Gheldere, Charles, M.D. 1898.
De Groot, Arthur, M.D. 1910.
De Laey, Georges, M.D. 1899.
De Nobele, Jules, M.D. 1891.
Di Geronimo, Giuseppe, M.D. 1901.
Faraci, Giuseppe, M.D. 1889.

Gardini, Luigi, M.D. 1900.
Garetti, Giulio, M.D. 1896.

Hamanaka, Kotaro, M.B. 1904.
Harada, Yakuo, M.B. 1909.
Houtsaeger, Camille, M.D. 1900.

Janssens, Alphonse, M.D. 1909.

Laenen, Jan M., M.D. 1889.
Lagrange, Jules, M.D. 1886.
Le Docte, Joseph, M.D. 1919.

Masschelein, Fernand, M.D. 1908.
Mertens, Jules, M.D. 1901.
Morishima, Kanichiro, M.B. 1911.
Mostaert, Georges, M.D. 1890.
Mourne, Fernand, M.D. 1912.

Oiye, Takeo, M.B. 1908.

Pollart, Achille, M.D. 1901.

Restaldi, Vittorio, M.D. 1899.
Rossi, Gaetano, M.D. 1900.

Sakurai, Fumio, M.B. 1912.
Sala, Robert, M.D. 1914.
Saporiti, Giuseppe M., M.D. 1893.
Suzuki, Tadashi, M.B. 1908.

Takahashi, Yasuo, M.B. 1909.
Tombeur, Francois J., M.D. 1912.
Tsukano, Toyojiro, M.B. 1908.

Van den Dungen, Eugene G., M.D. 1898.
Varese, Edoardo, M.D. 1904.
Verheyden, Englebert, M.D. 1905.
Vincke, Georges, M.D. 1904.
Vogel, Heinrich, M.D. 1910.
Vrebos, Amaury, M.D. 1900.

EPSOM COLLEGE: SIR WALTER BUCHANAN SCHOLARSHIP.—The Council will shortly award a Sir Walter Buchanan Scholarship, the value of which is about £33 a year. The rule fixed by the founders of the scholarship is as follows: The Sir Walter Buchanan Scholarship is primarily intended for the sons of deceased or prematurely invalided officers of the Indian Medical Service, or failing any such candidates for the sons of legally qualified medical men of pure British parentage in necessitous circumstances who have practised medicine for at least five years in India. Applications should be sent to the Secretary, Mr. J. B. Lamb, 49, Bedford-square, London, W.C. 1.

Medical News.

THE eleventh London Medical Exhibition will be held at the Central Hall, Westminster, from Oct. 3rd to 7th inclusive, open each day from noon to 6 P.M. This exhibition is limited to members of the medical profession, who can obtain cards of admission on application to the Secretary, at 194, Bishopsgate, E.C., or at the Hall during the exhibition week.

SOCIETY OF M.O.H.'s.—The annual dinner will be held at the Café Royal, Regent-street, London, W., on Friday, Oct. 21st, at 7.30 P.M., when Sir A. Mond, Sir Gordon Hewart, Sir Norman Moore, Sir Anthony Bowlby, Sir George Newman, and Sir Philip Magnus, among others, are expected to be present. Ladies are invited, and early application for tickets (price 12s. 6d.) should be made to the Executive Secretary, at 1, Upper Montague-street, London, W.C. 1.

ST. MARY'S HOSPITAL MEDICAL SCHOOL.—The following entrance scholarships have been awarded for the sessions 1921–22 :—

University Scholarships of 50 guineas each.—N. F. Adeney, B.A., St. John's College, Cambridge; W. R. H. Pooler, B.A., Downing College, Cambridge. University Exhibition of 30 guineas: G. B. Wood Walker, B.A., King's College, Cambridge.

Entrance Scholarships in Natural Science.—£100: B. W. Goldstone, Haberdashers School and Cheltenham College; £50: M. Odess, School of Mines and Technology, Johannesburg. Palmer Scholarship, £25: E. I. Puddy, Mercers School, Holborn. Epsom College Scholarship (by nomination): G. E. G. Pierce.

AMERICAN DIETETIC ASSOCIATION.—The fourth annual meeting of this Association will be held in Chicago on Oct. 24th, 25th and 26th. Among the papers to be read are: the Newer Ideas on the Dietetic Management of Diabetes and their Working Out in the Hospital, by Dr. R. T. Woodyatt; the Dietary Needs of a Children's Hospital, by Dr. A. L. Daniels; and the Hospital Dietitian, by Miss Marion Peterson. Papers on the dietary customs of various nationalities will be communicated by various observers, and round table discussions will be held on activities in dieto-therapy, laboratory research, and its clinical application. The Secretary of the Association is E. M. Geraghty, 801, S. Wright-street, Champaign, Ill.

MINISTRY OF PENSIONS.—The Minister of Pensions has now taken steps to make more widely known the benefits available to disabled officers and nurses and the relatives of those deceased. With this object a new series of leaflets (officially described as "M.P.O. Leaflets") is being issued, dealing with the following matters: No. 1, general information for disabled officers; No. 2, provision for disabled nurses; No. 3, medical treatment of disabled officers and nurses; No. 4, supply, renewal, and repair of surgical and artificial appliances (other than artificial limbs); No. 5, alternative retired pay; No. 6, pensions and allowances to widows and other relatives of deceased officers; No. 7, supply of artificial limbs (in preparation); No. 8, special grants committee's arrangements for officers and nurses and their dependents. Copies of Nos. 1, 2, 5, and 6 can be obtained on application to the Secretary, Officers' Branch, Ministry of Pensions, Cromwell House Annexe, Millbank, S.W. 1; of Nos. 3, 4, and (later) 7, to the Commissioner of Medical Services at any of the regional offices of the Ministry; and of No. 8 to the Special Grants Committee (Officers), Thorney House, Smith-square, London, S.W. 1.

CHARTERED SOCIETY OF MASSAGE AND MEDICAL GYMNASTICS.—The annual members' conference will be held on Oct. 6th–8th. On Thursday, Oct. 6th, at 11 A.M., a lecture will be given by Sir James Purves Stewart on "Disseminated Sclerosis" at the Mortimer Hall, 93, Mortimer-street, London, W. 1. At 3 P.M., demonstrations on "The Treatment of Empyema" and "The Tests and Progression of Muscular Work in Heart Cases" will be given by Miss Angove in the Physiological Theatre of Guy's Hospital, London, S.E., and the massage department of this hospital will be visited. At 6 P.M. Dr. Arthur F. Hurst will lecture on "Massage and Exercises in Gastro-Intestinal Disorders," at the Steinway Hall, 15, Lower Seymour-street, London, W. 1. On Friday, Oct. 7th, at 11 A.M., Sir Henry Gauvain will lecture on "The Treatment of Surgical Tuberculosis, with Particular Reference to the Indications for Massage," at the Mortimer Hall. At 3 P.M. Miss Stansfeld will give a lecture-demonstration on "The Importance of Physical Fitness for the Professional Woman," at the same place. At 6 P.M. Dr. J. B. Mennell will lecture on "Passive Movement," at the Steinway Hall. On Saturday, Oct. 8th, at 11 A.M., Dr. H. Crichton Miller will speak on "The Psychological Significance of Rest," at the Mortimer Hall.

LONDON TELEPHONE EXCHANGES.—Transfer from Paddington 1844 to Langham 2567, H. W. Carson; from Paddington 2608 to Langham 2551, C. W. Chapman.

ROYAL SANITARY INSTITUTE.—A sessional meeting will be held at 90, Buckingham Palace-road, London, S.W., on Oct. 12th, at 4 P.M., when a discussion will take place on Plumbing and Sanitation on Board Ship, Sir Henry Tanner presiding.

POST-GRADUATE COLLEGE, WEST LONDON HOSPITAL.—The autumn session of the College will commence on Monday, Oct. 10th. Particulars of lectures, clinics, and classes will be found in our medical diary.

MEDICAL OFFICERS OF SCHOOLS ASSOCIATION.—A meeting will be held at 11, Chandos-street, Cavendish-square, W., on Oct. 21st, at 4.45 P.M., when the subject of Games for Girls will be discussed.

AMALGAMATION OF LONDON HOSPITALS.—The negotiations for the absorption of the Royal Chest Hospital by the Great Northern Central Hospital, Holloway, having come to a successful issue, the committee of the latter institution have been made, by an order of the Charity Commissioners, responsible for the management of the Royal Chest Hospital as from Sept. 6th.

PHARMACEUTICAL SOCIETY OF GREAT BRITAIN.—The opening ceremony of the eightieth session of the School of Pharmacy will be held at 17, Bloomsbury-square, W.C., on Wednesday, Oct. 5th, at 3 o'clock. The presentation of the Pereira Medal will take place, and the inaugural sessional address will be delivered by Sir David Prain, F.R.S., director of the Royal Botanic Gardens, Kew.

NATIONAL ASSOCIATION FOR THE PREVENTION OF INFANT MORTALITY.—A course of elementary lectures on infant care, for infant welfare workers, mothers, teachers, &c., will be held at Morley Hall, George-street, Hanover-square, W., on Mondays, 6–7 P.M. from Oct. 3rd to Nov. 7th, and at the lecture hall of the Central Council for Infant and Child Welfare, 117, Piccadilly, on Mondays, 6–7 P.M., from Nov. 14th to Dec. 19th, in preparation for the elementary certificate of the Association.

Y.M.C.A. MEDICAL LECTURES.—A series of popular medical lectures is to be delivered on Mondays (6 to 7 P.M.), Oct. 10th to Dec. 12th, at the Central Y.M.C.A., 186, Aldersgate-street, London, E.C. The lecturers will be Sir James Cantlie, Sir Charters Symonds, Sir James Dundas-Grant, Sir Nestor Tirard, Sir Bruce Bruce-Porter, Prof. W. D. Halliburton, Sir Robert Armstrong-Jones, Sir Frank Colyer, and Sir Sydney Russell-Wells.

BIRMINGHAM GENERAL HOSPITAL.—Owing to the serious financial position of the hospital the board of management recently decided to close two wards, containing 50 beds. This resolution took effect on August 1st, one ward having previously been closed at the Jaffray Hospital, which works in conjunction with the General Hospital and relieves it of many chronic cases. The position is the more serious as Birmingham was already insufficiently provided with hospital beds, and it had been calculated that an additional 1000 beds were required to meet the needs of hospital patients. On August 20th a letter, signed by the Vice-Chancellor and Principal of the University with the Dean of the Medical Faculty, was addressed to the chairman of the board of management, expressing the regret of the Faculty of Medicine at the closure of the two wards. The Faculty is specially concerned in the matter because of the large entry of students since the war. Those responsible for the clinical teaching had drawn up a scheme so that each student might have a proper amount of clinical material allotted to him; this scheme had been prepared with considerable trouble, on the assumption that the full number of beds would be available. The Faculty expresses the hope that the public will realise the seriousness of the position which has been created, and will, by a prompt and liberal support, enable the board of management to reopen these wards at an early date. The chairman of the board, in reply, stated that such a serious course as the closing of beds had been taken only after the most careful consideration, and had, perhaps, been delayed even longer than it should have been in view of the financial situation. The board realise that, owing to the large influx of students, the duties of the Medical Faculty are exceptionally heavy at the present time, and they regret that these difficulties should be added to by the closing of wards. Special efforts have for some time past been made to increase the income of the hospital, and, although these are meeting with a certain measure of success, there is still so large a difference between income and expenditure that the board are quite unable to say when they are likely to be able to reconsider their decision.

LONDON DERMATOLOGICAL SOCIETY.—The first meeting of the winter session will be held at 4.30 P.M., on Tuesday, Oct. 18th, at 49, Leicester-square, London, W.C. The opening address on "Skin Eruptions Related to Intestinal Stasis" will be delivered by Sir W. Arbuthnot Lane. All members of the medical profession are invited.

MILK FOR MOTHERS AND INFANTS.—At an emergency committee meeting of the National Association for the Prevention of Infant Mortality the following resolution was passed:—

That this committee is strongly of opinion that the distribution of milk by sanitary authorities is a valuable measure for the protection of infant life. The committee therefore urges the Minister of Health, while doing everything possible to curtail extravagant expenditure, to continue the 50 per cent. grant to those authorities who are complying with Circular 185.

The resolution was based upon the feeling that this relief should be left in the hands of infant welfare centres, since these are able, by means of the expert physicians attached to each, to prescribe the right amount of milk and watch the results on mother and child. No such supervision would be possible if relief in the form of milk-giving were placed in the hands of the guardians, who have not the necessary machinery for such work.

MILK-SUPPLY OF DUBLIN.—Last week the Commission on the Industries and Resources of Ireland, appointed in 1919 by Dail Earann, took up the question of the milk-supply of Dublin, and heard a good deal of medical evidence. Dr. M. J. Russell, medical officer of health for Dublin, gave evidence of the difficulties which confront his department in endeavouring to safeguard the milk-supply of the city. In the first place, the corporation has no power to inspect or control sources of supply which lie outside the city. In the next place, the police magistrates are notoriously lax in the penalties they think fit to impose even on the most hardened offenders among milk dealers. Dr. Russell suggested that the penalty for a second offence should be prohibition to trade in future.

Medical Diary.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MEETINGS OF SECTIONS.

Tuesday, Oct. 4th.

SURGERY: SUB-SECTION OF ORTHOPÆDICS, at 5.30 P.M. (Cases at 5 P.M.)

Cases:—The following will be shown by:—
The President (Mr. Laming Evans): Phocomelia.
Mr. H. A. T. Fairbank: (1) A Case of Subluxation of the Hip-joint of Doubtful Origin. (2) Bilateral Snapping Hips—a further Report on a Case already shown.
Mr. R. C. Elmslie, Mr. W. H. Ogilvie, and Mr. W. Rowley Bristow will also show cases.

Wednesday, Oct. 5th.

HISTORY OF MEDICINE: at 5 P.M.
Statement by the President (Dr. Singer) with regard to the Third International Congress of the History of Medicine to be held in London in 1922.
Approval of the invitation extended to the Congress.
Nomination and election of an Executive Committee, &c.
To this meeting all those interested in the matter are cordially invited, whether Fellows of the Society or no.

Thursday, Oct. 6th.

OBSTETRICS AND GYNÆCOLOGY: at 8 P.M.

Specimens:
Mr. Malcolm Donaldson: Malignant Disease of the Cervix Uteri associated with a Malignant Omental Cyst.
Professor Henry Briggs: Green Intraperitoneal Exudate found on the Uterus during Cesarean Hysterectomy for Uterine Fibroids at Full Term.

Short Communications:
Dr. Barris and Dr. McCurrich: Case of Hæmatoma of the Vulva following Labour.
Dr. Robert A. Hendry (Liverpool): Case of Prolonged Gestation.

Paper:
Dr. Frank A. Nyulasy (introduced by Dr. D. Colquhoun and Mr. Dunhill): Polypoid Decidual Endometritis.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.
MONDAY, Oct. 3rd.—2 P.M., Dr. S. Pinchin: Medical Out-patients. Dr. Simson: Diseases of Women. 2.30 P.M., Mr. T. Gray: Visit to Surgical Wards.
TUESDAY.—10 A.M., Mr. Steadman: Dental Department. 11 A.M., Dr. McDougal: Electrical Department. 2 P.M., Dr. Burrell: Medical Out-patients. 2.30 P.M., Mr. Addison: Visit to Surgical Wards.
WEDNESDAY.—10 A.M., Mr. MacDonald: Genito-Urinary Department. 2 P.M., Mr. Addison: Operations. Mr. Gibb: Eye Department. Mr. D. Armour: Visit to Surgical Wards.
THURSDAY.—2 P.M., Mr. D. Armour: Operations. Mr. MacDonald: Surgical Out-patients.
FRIDAY.—2 P.M., Mr. T. Gray: Surgical Out-patients. 2.30 P.M., Dr. Pritchard: Visit to Medical Wards.
Daily:—10 A.M., Visit of Post-Graduates to Wards. 2 P.M., In-patient, Out-patient Clinics and Operations.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.
Special Intensive Course.
MONDAY, Oct. 3rd.—4.30 P.M., Clinical Lecture:—Lieut.-Col. W. Byam: The Invalid from the Tropics.
TUESDAY.—4.30 P.M., Clinical Lecture:—Dr. A. Giles: Sterility.
WEDNESDAY, 4.30 P.M., Clinical Lecture:—Mr. H. D. Gillies: Plastic Surgery in Civil Cases (lantern).
THURSDAY.—4.30 P.M., Clinical Lecture:—Sir William Willcox: Diabetes.
FRIDAY.—4.30 P.M., Clinical Consultations on Obscure Cases.
SATURDAY.—11 A.M., Dr. F. Thomson (at the North-Eastern Fever Hospital, St. Ann's-road, N.): Cases illustrating the Early Diagnosis of the Infectious Fevers.
Daily:—10.30 A.M. and 11.45 A.M., Demonstrations of Clinical and Laboratory Methods. 2 P.M., Demonstrations of Groups of Clinical Cases. 3 P.M.: General Hospital Work. 4.30 P.M., Clinical Lecture (free to Medical Practitioners).

NATIONAL HOSPITAL FOR DISEASES OF THE HEART POST-GRADUATE COURSE, Westmoreland-street, Marylebone, W.
MONDAY, Oct. 3rd.—11 A.M., Dr. J. S. Goodall: Out-patients. 2 P.M., Dr. R. O. Moon: In-patients.
TUESDAY.—9.30 A.M., Dr. B. T. Parsons-Smith: Out-patients. 10 A.M., Dr. F. W. Price: In-patients. 2 P.M., Sir Sidney Russell-Wells: Out-patients.
WEDNESDAY.—9.30 A.M., Dr. John Parkinson: Out-patients. 2 P.M., Dr. Moon: Out-patients.
THURSDAY.—2 P.M., Dr. Moon: In-patients. Dr. Price: Out-patients. 6.30 P.M., Dr. P. Hamill: Out-patients.
FRIDAY.—9.30 A.M., Dr. Parsons-Smith: Out-patients. 2 P.M., Dr. Parkinson: Out-patients.
SATURDAY.—10.30 A.M., Dr. Hamill: In-patients.

THE HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.
THURSDAY, Oct. 6th.—4 P.M., Lecture:—Dr. Thursfield: Types of Meningitis.

ST. JOHN'S HOSPITAL FOR DISEASES OF THE SKIN 49, Leicester-square, W.C.
THURSDAY, Oct. 6th.—6 P.M., Chesterfield Lecture:—Dr. W. Griffith: The Elementary Lesions of Skin Diseases.

ST. MARYLEBONE GENERAL DISPENSARY, 77, Welbeck-street, Cavendish-square, W.
Post-Graduate Course on Infant and Child Welfare.
A Course of Twelve Lectures on the Management and Feeding of Infants and Young Children by Dr. E. Pritchard to Qualified Practitioners.
WEDNESDAY, Oct. 5th.—6 P.M., Lecture I.:—Causes of Infant Mortality.
FRIDAY.—6 P.M., Lecture II.:—How to Conduct an Infant Consultation, Examine an Infant and keep Records.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE CLINIC.
TUESDAY, Oct. 4th.—4.30 P.M., Lecture:—Mr. J. W. Smith: Duodenal Atony.

Appointments.

STEVENS, B. C., M.D., M.S. Durh., D.P.H., has been appointed Medical Officer of Health for Grimsby.
WILLOUGHBY, J. F. D., L.R.C.P. Lond., M.R.C.S., Certifying Surgeon under the Factory and Workshop Acts for the Southwell District of the county of Nottingham.

Vacancies.

For further information refer to the advertisement columns.

Aberystwyth Infirmary and Cardiganshire General Hospital.—Res. H.S. £250.
Benenden, Kent, National Sanatorium.—Asst. M.O. £250.
Bethlem Hospital.—Res. H.P. £25 per quarter.
Birkenhead Borough Hospital.—Sen. H.S. £250.
Bournemouth, Royal Victoria and West Hants Hospital, Poole-road Branch.—Res. M.O. £200.
Bradford Children's Hospital.—H.S. £180.
Bradford Royal Infirmary.—Two H.S.'s. £200.
Bridgwater Hospital.—H.S. £165.
Brighton, Royal Sussex County Hospital.—Cas. H.S. £140. H.S.'s. £140.
Cardiff, City of.—Female Asst. M.O. £550.
City of London Hospital for Diseases of the Chest, Victoria Park, E.—Phys. to Out-patients.
Coulsdon, Netherne Mental Hospital.—Third Asst. M.O. £400.
Derby, Derbyshire Royal Infirmary.—Hon. Asst. Surg.
Eastbourne, Princess Alice Hospital.—H.S. £175.
Elizabeth Garrett Anderson Hospital, Euston-road.—Female Asst. S.
Exeter City Mental Hospital.—M.O. £350.
Frimley, Brompton Hospital Sanatorium.—Asst. Res. M.O. £250.
Glasgow Asylum Service.—Asst. M.O. and Pathologist. £275.

Glasgow District Mental Hospital, Gartloch, Garlcosh.—Jun. Asst. M.O. £350.
Hospital for Consumption and Diseases of the Chest, Brompton, S.W.—Res. M.O. £500. H.P. £50.
Hospital for Sick Children, Great Ormond-street, W.C.—Res. Asst. Cas. O. Res. H.P. Each £50.
Ilkeston, Borough of.—M.O.H. £700.
Leeds Public Dispensary.—Sen. Res. M.O. £250.
Macclesfield General Infirmary.—Asst. H.S. £150.
Metropolitan Hospital, Kingsland-road, E.—Cas. O and Res. Anæsth. £120. Sen. H.P. Sen. H.S. Asst. H.P. Asst. H.S. Each £100.
Miller General Hospital for South-East London, Greenwich-road, S.E.—Res. Cas. O. £200. Hon. Asst. Ophth. Surg.
Newport (Mon.) Education Committee.—Dentist. £500.
Northampton General Hospital.—H.S. £200.
Norwich, Norfolk and Norwich Hospital.—Cas. O and H.S. £200.
Nottingham General Hospital.—H.P. £200.
Oldham Royal Infirmary.—Sen. H.S. £200.
Plymouth, South Devon and East Cornwall Hospital.—H.S. £200.
Prince of Wales's General Hospital, Tottenham, N.—H.P. H.S. Each £200. Jun. H.S. Jun. H.P. Each £120.
Queen's Hospital for Children, Hackney-road, Bethnal Green, E.—Cas. H.S. £100.
Royal Free Hospital Gray's Inn-road, W.C.—H.S. £50.
Royal London Ophthalmic Hospital (Moorfields Eye Hospital), City-road, E.C.—Refraction Asst. £100.
Royal National Hospital for Consumption and Diseases of the Chest, Ventnor, I.W.—Med. Superintendent. £1000.
Royal National Orthopædic Hospital, 234, Great Portland-street, W.—Clin. Asst. £105.
Ryde, Royal Isle of Wight County Hospital.—Res. H.S. £200.
Sheffield Royal Infirmary.—H.S. H.S. for Ear, Nose and Throat. Each £150.
Singapore, Government Medical School.—Professors of Physiology, Anatomy, Medicine, Midwifery and Gynæcology. £1190. Lecturers in Chemistry and Physics, Biology. £840.
South Africa, Union of, Mental Hospital Service.—Asst. Physicians. £400.
Swansea Hospital.—H.S. H.P. Each £200.
Sydenham, South Eastern Hospital for Children.—Res. M.O. £100.
Western Ophthalmic Hospital, Marylebone-road, N.W.—Non-res. H.S. £150.

THE Chief Inspector of Factories announces the following vacant appointment:—Bradford, West (York, West Riding).

THE Secretary of State for the Home Department gives notice that he proposes to appoint a Second Medical Referee under the Workmen's Compensation Act, 1906, resident preferably in West Norfolk, for the Attleborough, Aylsham, Downham Market, East Dereham, Fakenham, Holt, King's Lynn, North Walsham, Norwich, Swaffham, Thetford, and Wymondham County Courts, in Circuit No. 32. Applications for the post should be addressed to the Private Secretary, Home Office, and should reach him not later than Oct. 19th, 1921.

Births, Marriages, and Deaths.

BIRTHS.

BOOTH.—On Sept. 19th, at Wellington, Madras, the wife of Major E. B. Booth, D.S.O., R.A.M.C., of a daughter.
DODSON.—On Sept. 19th, at the Corner House, Caythorpe, Grantham, the wife of Major Charles S. Dodson, late R.A.M.C., of a son.
DUNLOP.—On Sept. 24th, at Golders Green-road, N.W., the wife of Dr. W. A. L. Dunlop, of a daughter.
HUNOT.—On Sept. 17th, at Victoria-road South, Southsea, the wife of Surgeon-Lieut.-Commander F. C. Hunot, R.N., of a daughter.
MICKLEM.—On Sept. 12th, at King-street, Great Yarmouth, the wife of T. E. Micklem, M.B., of a son.

MARRIAGES.

GOSSET—HUTCHINSON.—On Sept. 6th, at the Parish Church, Ilfracombe, A. Christopher Vidal Gosset, M.R.C.S., L.R.C.P., to Marjorie M. Caldwell, youngest daughter of Mr. and Mrs. Hutchinson, of Ilfracombe.
HERAPATH—BRACEY.—On Sept. 21st, at St. Nicholas Church, Great Yarmouth, Charles Edward Kynaston Herapath, M.C., M.D., to Phyllis Gertrude, eldest daughter of H. J. Bracey, Marine Parade, Great Yarmouth.
READ—SADLER.—On August 4th, Harold Read, M.R.C.S., L.R.C.P., L.D.S., of 17, Welbeck-street, W.1, to Georgina Constance Sadler, of Netherwood, East Molesey.

DEATHS.

LEYTON.—On Sept. 21st, at Great Shelford, Cambridge, Albert Sidney Leyton, M.D., Sc.D., F.R.C.P., D.P.H., aged 52 years.
LOXTON.—On Sept. 20th, at Budleigh Salterton, Devon, Arthur Loxton, M.B., Ch.B., F.R.C.S. Edin., Senior Surgeon to the Birmingham Skin and Urinary Hospital, of Oxford-road, Moseley, and Cornwall-street, Birmingham, the dearly loved husband of Kathleen Loxton. Heart failure while bathing.
STEDMAN.—On Sept. 21st, at Fulwood-road, Sheffield, Thomas Bernard Stedman, M.D. Lond., M.R.C.S., L.R.C.P. Lond., D.P.H. Camb., aged 49 years.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Short Comments, and Answers to Correspondents.

SCIATICA:

SOME RECENT SCANDINAVIAN INVESTIGATIONS ON ITS PATHOGENESIS.

BY DR. HANS JANSEN,
DIRECTOR OF THE DEPARTMENT FOR MASSAGE AND HYDROTHERAPY AT BISPEBJERG HOSPITAL, COPENHAGEN.

OF late years there has been a tendency to look upon the neuralgias as forms of neuritis; that is to say, it is presumed there is in all these diseases an inflammatory condition in the nerve or in its sheath. K. A. Petrén in particular has supported this view in the Scandinavian Text-book of Medicine, 1916. On the other hand, Wertheim Salomonson and Oppenheim continue to regard neuralgia as a purely functional irritation of the nerve without demonstrable anatomical changes. This view is also held with regard to sciatica. Petrén previously explained in a similar way certain cases of sciatica, in which he found myositis (or at any rate spasm) in the deep gluteal muscles, and he thought that this condition alone might possibly cause sciatica by pressure on the sciatic nerve. This muscular origin of sciatica is discussed in Kleen's handbook on massage, and is well known to all masseurs and doctors skilled in that subject.

Helweg in Denmark and Lindstedt and Ljungdahl in Sweden have busied themselves with the subject, but while Lindstedt and Ljungdahl are content with classing sciatica as a pure neuralgia, Helweg goes further, excluding it from the neuralgias and looking upon it as a muscular complaint.

Helweg's Theory: Sciatica a Muscular Disease.

Helweg's point of view is as follows[1]: "Sciatica is a disease of the kinetic system, caused by overwork, and dependent upon disturbance of muscular coördination." Osteo-arthritis deformans coxæ may, for example, be the starting-point. Chronic hip disease leads to more or less contracture or spasm of the local muscles. They perform static work, which is very fatiguing. If the patient continues to get up and do his work, which means that in addition to the static work the muscles have also to perform ordinary (dynamic) work, then the hip muscles get overtired, and this will mean greater demands on the other muscles "of the same synergic group": that is to say, muscles which take part in the performance of the same function—for example, in the case of walking, the muscles on the posterior aspect of the thigh. By degrees these muscles may also become exhausted and the hyperfunction reach right down the leg. The same thing takes place in spondylitis deformans, where the point of origin is the disease in the vertebral column, which leads to "static function of the erector spinal muscles in order to fix the affected area." Lastly, "unsuitable attitudes assumed during work, or working at an inconvenient rate," can produce the same result, because certain groups of muscles become exhausted with the result that others have to function excessively, and so on. That the individual does not stop in time may be due to pressure of work, effect of alcohol, &c. Helweg considers the overworked muscles become the seat of pathological changes. He points to lactic acid as the offending substance in accordance with an experiment of J. Lindhard, which shows that lactic acid accumulates in the statically functioning muscles. The muscles are tender in all cases, and in the aggregate these tender and painful muscles along the back of the leg—according to Helweg—afford the clinical picture of the disease we call sciatica.

Sensibility of the Nerve Trunk.

There are many important objections to this theory. In the first place Helweg has not brought any incontestable proof that the disease is not situated in the nerve, or at any rate implicates it. His main thesis is this: when we examine the external popliteal nerve, which is the only part of the nerve trunk which can be directly palpated, we find it is not tender. Now this is not quite correct; even if one is satisfied with "stroking" the nerve, as Helweg is, it will often be found more sensitive than a normal nerve. But on the other hand there is nothing at all unusual in the fact that a thick nerve *trunk* composed of motor and sensory fibres and surrounded by dense connective tissue is relatively insensitive. As is rightly pointed out by Wertheim Salomonson, it is not the nerve trunk, but its cutaneous branches, which are tender and give rise to the

[1] Joh. Helweg: Ischias, En Klinisk Studie (Sciatica, A Clinical Study), Thesis, Copenhagen, 1920.

" points douloureux " of Valleix. This condition is known in another undoubted nervous disease—alcoholic polyneuritis. In this complaint the nerve trunks are relatively only slightly painful, while the muscles are extremely painful.

But deprived of this argument, the whole fabric of Helweg's proof that the nerve is not the seat of the trouble vanishes. And his only evidence that pathological changes are found in the muscles is that they are tender and their consistence is altered. But this need only indicate that they are in a condition of partial contraction. Microscopic examinations or animal experiments were not performed by Helweg. He has therefore in no way proved that sciatica is a muscular disease, and by his theory the explanation of a number of facts becomes difficult. For instance: (1) That the tenderness closely follows the course of the nerve along the back of the leg and its furthest branches as far as the foot. (2) The position of Valleix's points: centrally on the posterior aspect of the thigh; in the middle of the popliteal space; in the middle of the calf; at the side of the leg; behind the external malleolus. (3) The disturbances of sensation and localised paralysis met with now and again in sciatica. (4) The suddenness with which many cases of sciatica arise, and with which, on the other hand, they frequently get well, for example, after a salt water injection. (5) That sciatica is, as a rule, unilateral. Bilateral sciatica is rare, and arouses suspicion of a tumour of the vertebral column, or diabetes. Following Helweg, it might be expected that the disease is often bilateral because the patient involuntarily stands more upon the sound leg than the diseased one, which might lead to hyperfunctioning of the muscles of the normal leg. (6) That sciatica is such a typical disease. According to Helweg, one would expect to find many different forms with pain localised at one time in a certain muscle, at another time in some other muscle dependent upon the work and activity of the patient. The pathogenesis of the disease suggested by Helweg does not satisfactorily explain a number of phenomena. Helweg will not admit the existence of a toxic or infectious sciatica, or of that form due to pressure. But he brings forward no proof that pressure cannot give rise to neuralgia, especially sciatica. It is impossible to support Helweg in his view of the pathology and clinical side of sciatica, but it must be admitted that he has performed a service in emphasising muscular hyperaction as a pathogenetic factor, as it undoubtedly plays a part in many different diseases, and—as we shall see—presumably also contributes to the pathogenesis of a number of cases of sciatica.

Views of Lindstedt.

Folke Lindstedt, a teacher at the Koroline Institute in Stockholm, has published some papers on sciatica[2] in the last few years, in which he supports the following view: Sciatica, in the large majority of cases, is a pure neuralgia, a functional disease without anatomical findings in the nerve. It arises from the presence of painful or merely irritating conditions in the periphery of the nerve which cause pain *radiating* into the whole of the sciatic area in the same way that toothache can produce trigeminal neuralgia. The irritation must have a certain amount of persistence or strength, and the person must have a susceptibility to neuralgia. If the susceptibility, " the neuralgic disposition," is great—in other words, if the individual is markedly neurasthenic—the " irritamentum " need only be trifling.

In an investigation of 100 cases of sciatica Lindstedt claims to have found the irritamentum in 91, as follows: tumours in 3 patients; lesions of the spinal column, 8; salpingitis, 2; appendicitis, 1; chronic arthritis of the hip-joint, 9; acute ditto, 2; fracture of the femur, 2; trauma of the knee-joint, 11 (N.B.—Often many years back); chronic arthritis of the knee-joint, 3; genu valgum, varum or recurvatum (total), 8; trauma of the feet, 5 (N.B.—Often many years ago); flat foot (Insufficientia pedis), 11; polyarthritis, 12; varicose veins, 8; infantile paralysis, 1; constitutional weakness, 3; septic affections, 2. As a rule these diseases do not exert their irritation directly, but through causation of muscle contractures and static abnormalities. On account of these, certain muscles are overtaxed and become painful, and it is these pains which constitute the peripheral " stimulus." He also considers, however, that painful affections in the periphery can directly give rise to referred pain without involving the muscles. The referred pain need not necessarily extend into the whole of the sciatic area, it may be restricted to a single division, but it can also involve neighbouring regions such as the lumbar. In this way Lindstedt explains the frequent association of lumbago and sciatica. He discusses the possibility of muscle contractures directly causing pain by pressure on the nerve trunk, as suggested by Petrén in 1908; but he rather discounts this by assuming that there is not always contracture present.

Comparative Views.

It is clear there is a marked difference between the points of view of Lindstedt and Helweg. A superficial similarity exists in the fact that Lindstedt allows muscular contracture and tenderness to participate in his explanation of sciatic neuralgia. But he entirely scorns the idea that the muscles themselves are the seat of the trouble. On the other hand he is inclined, like Helweg, to look upon the neuritic symptoms, anæsthesia and paresis, as functional and due respectively to exhaustion of the central receptive apparatus and of the muscles. He indicates that Lasègue's symptom may possibly be caused by tightening of the muscles, and does not feel sure that the nerve trunk itself is painful. Lindstedt's view will certainly receive the greater measure of support. The prominence he gives to the neurasthenic element, " the neuralgic disposition," is undoubtedly just; one can also agree with him that many of the pathological lesions he cites as causes of the disease play a part—for instance, the chronic hip and knee-joint affections, spondylitis and flat foot. But he certainly goes too far when he makes trauma of the foot and knee, acquired years ago, responsible for sciatica, or when he sees a causal nexus between appendicitis, salpingitis, varicose veins, polyarthritis, and many other affections occasionally found in a sciatic patient, and sciatica itself. Lindstedt is unable to bring forward any sound evidence of a connexion; the combination can just as well be explained as fortuitous. There is, after all, something forced in this attempt to view all cases of sciatica as secondary. In most cases sciatica is apparently a true disease with a typical course and of limited duration. The pathogenesis championed by Lindstedt is better adapted to chronic conditions with occasional sciatic pains. Moreover, he himself points out that material from the out-patient department might possibly have afforded more cases of genuine sciatica; the above-mentioned investigation deals only with in-patients.

Ljungdahl's Hypothesis.

Ideas of a similar nature are held by Ljungdahl.[3] But there is a not inconsiderable difference. Ljungdahl only deals with sciatic pain in spondylitis deformans and osteoarthritis deformans coxæ. He is not out to show that the pain is caused by these maladies, but simply constructs an hypothesis for the way in which they arise. The hypothesis is this: the pain is a reflex phenomenon similar to Mackenzie's viscero-sensory reflex. What gives rise to the reflex is the early destruction in the diseased portion of the bone or cartilage. He regards the conditions as traumata threatening the tissues with destruction or breaking down. The pain is the patient's signal of distress; the simultaneous contractures in the surrounding muscles are similarly the self-defence of the organism, analogous to Mackenzie's viscero-motor reflex. Ljungdahl, therefore, does not think that the muscle contractures and the associated tenderness contribute to cause the pain; in other words, he does not consider that the extent of the contractures and the amount of pain bear a close relationship to one another. Nor are Ljungdahl's views entirely in harmony with the theory of referred pain, since this postulates primary pain which overflows into other channels. Ljungdahl regards every explanation connected with myositis—that is, all inflammatory conditions of the muscles—and the extension of the trouble, perineuritis, as having no foundation, and does not agree that inflammatory infiltration of the muscles could produce nerve tenderness, from pressure. But he passes over the possibility of muscular contracture being able to cause it. He talks about exhaustion myalgia, but does not make use of it in the pathogenesis of sciatica.

General Conclusions.

I will review, in conclusion, what emerges from the above considerations on sciatica, as far as I am able to judge.

Sciatica is a symptom-complex which can arise under the most diverse circumstances. There is certainly a group—perhaps not large, but certainly existent—of neuritic sciaticas. It comprises the following: cases where the nerve fibres themselves are affected: alcoholic and lead neuritis especially localised in the sciatic nerve; the not uncommon sciatic neuritis in diabetes, which can only be cured by an appropriate diet; herpes zoster neuralgia in the sciatic nerve, in which, of course, there is affection of the spinal ganglia—probably a number of cases of influenzal and malarial neuralgia (and neuritis) also belong to this class; lastly, malignant growths in nerves. There is

[2] E. F. Lindstedt: Bidrag t. u. Kännedomen om ischias' patogenes och Etiologi (Contribution to our Knowledge of the Pathogenesis and Ætiology of Sciatica). Sv. läkaresällskapets förhandlingar, Hft. 9, 1919. Read at the Medical Congress in Copenhagen, August, 1919. F. Lindstedt: Ueber die Ätiologie und Pathogenese der Ischias, Acta Medica Scand, May, 1920.

[3] M. J. J. Ljungdahl: Nerv-och muskelsymptom vid deformerande arthritis. Ett bidrag t. u. Ischias' patogenes (Nerve and Muscle Symptoms in Arthritis Deformans. A Contribution to the Pathogenesis of Sciatica), Alm. svenska läkartidningen, 39-40, 1919.

another group in which direct pressure upon the nerve trunk or its roots is just as good an explanation as do referred or reflex phenomena, such as the ordinary sciatic pains of pregnancy, sciatica with benign and circumscribed malignant tumours of the pelvis, deep abscesses, hæmatomata, abundant formation of callus after fracture, &c. So long as it is not disproved that neuralgia can originate in a nerve exposed to abnormal pressure, this pathogenesis cannot be rejected.

Cold can undoubtedly increase the severity of sciatica, and perhaps even cause it to appear; but probably the rationale is that cold induces muscle contracture which gives rise to referred pain, or pain due to pressure. There are also cases in which the theory adopted by Lindstedt is the most probable. Flat foot and similar static abnormalities in the lower extremity can undoubtedly cause sciatica. Here again the route is doubtless via the muscles. Many other painful affections of the leg can also on occasion produce the disease; thus in my student days I learnt that a corn could be the starting-point. Perhaps here also the muscles are interposed in the chain of causation by occasioning a defective way of walking, or certain muscles are strained to avoid the pain. I can well imagine that hyperaction of the flexor muscles of the leg alone could bring on sciatica, the over-worked and tender muscles causing a referred neuralgia of the sciatic region. Lastly, there are the sciatic-like pains often met with in osteoarthritis deformans coxæ and spondylitis deformans—particularly, as Ljungdahl points out, in the early stages. Ljungdahl's view that trauma of the tissues can be a causative factor seems to me interesting, but I do not think one can exclude the possibility of muscle contractures in the lumbar and gluteal regions contributing to the pain. In fact, I cannot dismiss the old-fashioned idea that contractures can produce sciatic pain directly by pressure on the nerve trunk, the pyriformis and gemelli muscles contracting simultaneously.

Sciatica due to Traumatic Lumbago.

There are still very many quite ordinary cases of sciatica which do not fall into the above categories. These are cases consequent upon traumatic lumbago. There is a distinct tendency to discount, or completely neglect, this condition; insurance doctors are particularly afraid of it, because they think patients are only too willing to talk of "overstraining," immediately they get a pain in the loin. But as a matter of fact our back muscles very often run the risk of overstrain. Many people have had the experience at one time or another of lifting something which was distinctly heavier than expected, or have given a sudden energetic jerk to avoid a fall, and have thus straightway acquired lumbago; moreover, in some of the more severe cases many have no doubt noticed a tendency to sciatic pain. I have met with a large number of patients whose sciatica was doubtless only an aggravation or further development of lumbago.

Symptoms.

It only remains to deal with the symptoms. The pain follows the course of the nerve, particularly the cutaneous branches with their sensory fibres; also the branch coming directly from the sacral plexus—namely, the small sciatic nerve. The latter reaches as far as the popliteal space, and it is possibly its end branches which are responsible for hypersensitiveness in this situation. Valleix's points are for the most part caused by the cutaneous branches. On the leg and foot they are the cutaneous branch of the internal popliteal nerve, the external cutaneous, the external saphenous, and the cutaneous branches of the internal plantar nerve. Lasègue's sign can easily be elicited in most cases by stretching the nerve, but it must be admitted it can also be obtained by stretching the contracted hamstring muscles, in the form of referred pain in the nerve. Some people have extremely short ham-string muscles, so that stretching begins much earlier than usual on both sides. Anæsthesia and paralysis—and, presumably, also absence of the Achilles tendon reflex—should probably be taken as a sign of neuritis. Atrophy I consider to be most frequently due to inactivity.

Ordinary uncomplicated sciatica is a benign disease which of itself tends to get well. When it appears to be chronic, it is either because it is secondary to one of the many cited chronic complaints, or because it has produced a kind of traumatic neurosis in the patient. In such a case it can always be dissipated by appropriate suggestion. In treating sciatica the neurasthenic element must always be kept in mind. Bromides are therefore good drugs to administer, and excellent results can be obtained by the most diverse means from the ordinary camphor oil injections to cauterisation of the external ear. Injections of salt water also have a transitory deadening effect. The first part of the treatment should be designed to combat the muscle cramps and contractures. Heat and massage are the sovereign remedies. The massage should be "dispersing," and principally applied to the lumbar and gluteal regions. Friction and similar stimulating manipulation of the nerve is useless. The musculature of the whole extremity, later on in the treatment, will benefit from massage directed against atrophy. And, finally, at the close of treatment of every case of sciatica, remedial gymnastics should be prescribed to revive the natural function and correct the acquired faulty position.

SOVIET RUSSIA AND PROSTITUTION.

THE conclusion of Mme. Alexandra Kollontay's speech[1] to the Russian Communist Party has come to hand and it is disappointing to find no definite indication of policy in regard to checking the spread of venereal disease. This second instalment contains a terrible description of how prostitution has increased under Bolshevist rule. The central organ of the People's Commissariat of Social Welfare organised, under the leadership of Dr. Golman, an Interdepartmental Commission to Combat Prostitution. The Commissariats or Ministries of Justice, Health, Education, Labour, and other public services were also called upon to help. Discussions were held on the causes, especially the economic causes, of prostitution, without reaching agreement as to practical measures to protect the health of the people. The Interdepartmental Commission officially states that, while professional prostitution is not widely developed in Russia, clandestine prostitution prevails everywhere. Thus, before the revolution there were at Petrograd from 6000 to 7000 registered prostitutes and more than 50,000 women were clandestine prostitutes. To-day we are told: "Prostitution is practised by the Soviet office employees, in order to obtain, by the sale of their bodies, boots that go up to the knee; prostitution is resorted to by the mothers of families, working women, peasant women, who are out after flour for their children and sell their bodies to the manager of the rations division in order to obtain from him a full bag of the precious flour. Sometimes the girls in the offices associate with their male superiors, not for manifestly material gain, for rations, shoes, &c., but in the hope of advancement in the office. And there is an additional form of prostitution, 'careerist prostitution,' which is also based in the last analysis on material calculations."

"Deserters from Work."

At first the idea of prosecuting prostitutes was discussed, but the Ministry of Justice and the other authorities concerned agreed that the only crime for which a prostitute could be arrested was that of being a "deserter from work." In that case, however, a lawful and virtuous wife existing in idleness on the means her husband provided was also a deserter from work. The only thing harmful to the interests of the workers, according to Mme. Kollontay, is the substitution of crassly materialistic calculation of gain for a free association of the sexes on the basis of mutual attraction. This is inadmissible, for it destroys the feeling of equality and solidarity between the sexes, yet no sufficient definition could be given to make it punishable by law. It was, therefore, decided that all persons found wandering about the streets should be placed at the disposition of the Commissariat of Social Welfare and thence sent out after inquiry either to the Sections for the Distribution of Labour Power, or to the People's Commissariat of Labour, or to sanatoriums, hospitals, &c.; and only after evidence of malicious intent to desert from work would the individual be condemned to forced labour, but there is no special culpability attached to prostitutes. No details are given as to the measures taken to decide whether they should be sent to a hospital; we are only told prostitutes must not be separated from or treated differently than other deserters from work. Indeed, all the reports deal with the difficulty of defining prostitution as a crime and of excluding the man from punishment. If the crime consists of the purchase and sale of caresses then the husband of a woman who married him for his money should also be punished!

Remedies.

In spite of all these obstacles, there is a general agreement that if all women had work to do and were sufficiently paid for their work, the principal cause of prostitution would be removed. Consequently the Soviet has adopted a law that the earnings of working men and working women shall be equal. Unfortunately, the majority of women are unskilled workers and are generally insufficiently paid. Better education, especially technical education, better housing, the special teaching in schools of history of the relationship of the sexes on a rigidly scientific basis, are therefore advocated as remedial measures.

Such are the principal points Mme. Kollontay has brought out, based on official reports to the Soviet Government. To her mind, the realisation of the proposals made will tend to do away with the old form of family life and of prostitution. There must be no material calculations in the conjugal relations of the future. They must arise from

[1] THE LANCET, August 20th, 1921, p. 421.

"the healthy instinct of reproduction, beautified in the attractive colours of youthful love, in the strong tones of passion, in the delicate tints of spiritual harmony," and have nothing in common with prostitution, "which is offensive because it is an act of violence on the part of the woman over herself, brought about by the pressure of fortuitous and external advantages; in prostitution there is no place either for love or for passion, nor is there any healthy instinct for the production of offspring. It is an act of deliberate calculation merely. Where passion or attraction enters prostitution ceases."

INFLUENZA IN MAURITIUS.

"THE Spanish Influenza in Mauritius" is the title of a brief account of the 1919 epidemic on that island, written by Mr. A. F. Fokeer, a layman who has been at pains to collect and summarise medical opinion concerning the infection and its treatment. Mr. Fokeer claims that up till the cholera epidemic of 1852 Mauritius was one of the healthiest places in the world; increase of population with no corresponding increase of housing facilities, and with defective sanitation, have considerably dimmed its reputation, and the account opens with an indignant denial of the allegation that present conditions are chiefly due to the large Indian section of the community. However that may be, isolated cases of influenza appeared in April, 1919; by May 14th the epidemic had broken out, and in the period from that date till the end of July it carried off 15,000 people—i.e., between 5 and 6 per cent. of the population of the island. There was an almost complete stoppage of trade and public business; the newspapers appeared intermittently, and the railway service was reduced to a minimum. Energetic measures were taken by the Government to combat the epidemic; the civil service and various voluntary organisations rendered valuable aid, but for an interval there were neither sufficient temporary hospitals to house the sick, nor time and materials for proper burial of the dead. Mr. Fokeer worked for a fortnight in a hospital mainly staffed by a Roman Catholic brotherhood, and then fell ill himself. One chapter which is occupied with a discussion on the possibilities of personal survival after death seems hardly relevant to the reader, although the author doubtless found it otherwise. Of more medical interest is the section devoted to the Ayurvedic view of influenza and its treatment.

SAFE CUSTODY OF DRUGS.

CONSIDERABLE publicity has not unnaturally been given in the press to the death of four patients at Powick Mental Asylum through a member of the medical staff of the institution having made up for them and six others glycerine and belladonna instead of glycerine and cascara. The medical man who made the mistake gave a perfectly frank account at the inquest on three patients who died almost immediately, and at a later inquest on a fourth who was thought to be recovering, but who succumbed to pneumonia. He explained what he had done by saying that he never expected that belladonna would be found placed in juxtaposition with castor oil and other drugs of similar harmless character. A verdict of death by misadventure was returned. It may be said in comment that neither a drug such as belladonna nor any other drug for use in a dispensary should be kept in a bottle or other receptacle bearing no inscription or ready means for identifying it without possibility of mistake; and also that insistence on orderly arrangement in accordance with fixed rules would provide a further potent safeguard. With regard to this a woman medical correspondent writes to us to lay emphasis on the necessity for impressing such orderliness upon all who have charge of drugs of any kind, including medicines, lotions, and liniments whether professionally or otherwise. She refers in particular to the giving of instruction in such matters to school children and others in the course of lessons on hygiene. Orderly habits can certainly be taught, particularly where the necessity for them can be pointed out to, and impressed upon, the pupil. In homes as well as in hospitals they should be matters of discipline and routine.

PRESENT-DAY GOLF.

IN a book with this title,[1] by George Duncan and Bernard Darwin, with photographic illustrations by G. W. Beldam, all tastes and handicaps, are catered for. The scratch man, we imagine, will give his attention chiefly to the first part, in which Duncan describes and analyses the methods by which famous players achieve their results, and discusses such matters as putting and wrist work, the distribution and transference of weight, and the correct use of the various clubs. All this is rather strong meat, and if we had any hope that our advice would be taken, we should urge the long handicap man to be cautious in practising the principles which Duncan sets forth, for the strong man's diet may well prove fatal to infants and invalids. But there is no one more hopeful than the hopeless duffer, and certainly if the game can ever be learnt from books, it can be from this one. The illustrations to these chapters are numerous and excellent. Particularly fine is one which shows the author's follow through; it is a model of controlled abandon. Mr. Darwin, who is responsible for two-thirds of the volume, writes in his own inimitable way of heroes past and present, famous courses and famous finishes, handicapping, and a host of other things. Particularly delightful is his chapter on children and golf; it could only have been written by one who is richly endowed with the spirit of both. We have no doubt that this book will prove a source of profitable enjoyment to keen golfers who spend the long winter evenings reading, talking, and thinking of their favourite game.

[1] London: Hodder and Stoughton, Ltd. 1921. Pp. 308. 15s.

COLOUR EQUATIONS.

AN important method of examining the colour-sense is that of equations of colours, and the white equation is the one usually employed. Two or three colours, for example, spectral red, green, and violet, are mixed until the resultant is indistinguishable from simple white. By means of the Abney apparatus, as modified by Fulton, Mr. F. W. Edridge-Green has recently[1] isolated these colours from the spectrum of a 1000 c.p. "Pointolite" lamp, and then recombined them by means of a lens. The equation obtained after the observer's eyes had been fatigued by light from the red end of the spectrum showed a much lower proportion of green, approximately half the amounts obtained under normal conditions. A variation in the same direction was found also in the colour-blind. The importance of these observations lies in the supposition that red light affects only the hypothetical red sensation, and Mr. Edridge-Green considers them quite inconsistent with the three-sensation theory.

THE BOTTLE-FED BABY.

A SMALL pamphlet[2] written for the Society for the Prevention of Sickness embodies much of the more recent teaching on the artificial feeding of infants, its 22 pages being packed with practical and detailed instruction for mothers. In an introductory note, Dr. Emile Berliner points out that before the introduction of milk pasteurisation one bottle-fed baby out of four died before the end of the first year, and though these figures have been greatly reduced, there is no doubt that if the advice given in these pages were to be more generally followed a still further reduction would be ensured. The first three pages of the pamphlet are devoted to the subject of breast feeding, intervals of three hours being advised from the third day till the end of the eighth month, with six feeds in the 24 hours during the last four months. The author perpetuates the old idea, somewhat discredited of late, that malt liquor is a galactogogue. With regard to the treatment of cow's milk, while pasteurisation is approved of for older children, Dr. Steinberg strongly recommends the scalding or boiling of milk for babies as rendering it more digestible. In this connexion photographs published by Dr. Joseph Brenneman are reproduced, illustrating the appearance of raw whole milk, pasteurised milk, and boiled milk respectively, after 30 minutes to two hours in the stomach, pointing the moral that raw milk is like a solid food in the stomach and unsuited to the baby's powers of digestion. Simple but detailed directions are given for the preparation of the baby's bottle, as also for the use of milk powder, schedules of feeding up to one year old being also appended. The pamphlet has an appreciative foreword by Prof. George M. Kober, Professor of Hygiene and Preventive Medicine at Georgetown University.

[1] Proc. Roy. Soc., B., vol. xcii.

[2] The Bottle-fed Baby. By Alfred J. Steinberg, M.D., Washington: Jim Publication Co. 1921. Pp. 22.

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